

**national**

Two Sections — Section 1

# SAFETY NEWS

MARCH 1955

1955

**ANNUAL  
SAFETY  
EQUIPMENT  
ISSUE**

Kenneth



## Here's an important step in promoting safety in your plant

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Call the M.S.A. man on your every safety problem  
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# SAFETY NEWS

MARCH 1955

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Two Sections: Section 1  
Section 2: Service Guide 2.1



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# **national SAFETY NEWS**

**MARCH 1955**

## **Your Investment In Protection**

**I**N EVERY up-to-date plant, safety equipment comprises an important investment. Yet in proportion to the cost of accidents, it represents an extremely small outlay.

Safety equipment, originally, was limited pretty much to guards for machines and personal protective equipment for workers. A tour of the Safety Exposition held each year in connection with the National Safety Congress or a glance through the pages of this issue will show how the field has expanded. Safety equipment now includes all products--services, too--which safeguard the health and comfort of the employee as well as those which protect him from accidental injury.

A clean, orderly, well-guarded plant, with protective apparel where needed, does more than protect employees against immediate hazards. It reminds them that the company's safety program is not just talk.

Our Eighteenth Annual Safety Equipment Issue has been planned to help readers in the purchasing, use and maintenance of safety equipment, to help them get value from their investment in protection.

Preventing accidents is an all-year job, with no vacation. It is recommended, therefore, that this issue be kept in a convenient place to serve as a guide to purchasing. In addition to the product information in the 11 sections, the reader will find much helpful material in the classified sections and in the advertisements.

The issue, of course, cannot hope to take the place of more detailed works on accident prevention, such as the National Safety Council's *Accident Prevention Manual for Industrial Operations* and the publications of such organizations as the American Standards Association, National Fire Protection Association, National Board of Fire Underwriters, U. S. Department of Labor, and professional and technical societies. And the handbooks and catalogs of many manufacturers rate a place in the safety man's library.

The relation of this issue to the more comprehensive works on safety is comparable to that of a desk dictionary to the unabridged.

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# Safety Gained in 1954

Preliminary estimates show 4,000 fewer fatalities for all classifications. Work, home and motor deaths decline

THERE were approximately 14,000 deaths from work accidents in 1954, or 1,000 fewer than in 1953. Decreases occurred in six of the eight principal industrial groups.

A reduction of 400 was recorded for manufacturing—the largest improvement made by any industry. The transportation industry had 200 fewer deaths than in 1953, and there were decreases of 100 each in trade, public utilities, construction and mining. Service and agriculture had the same number of fatalities as in the previous year.

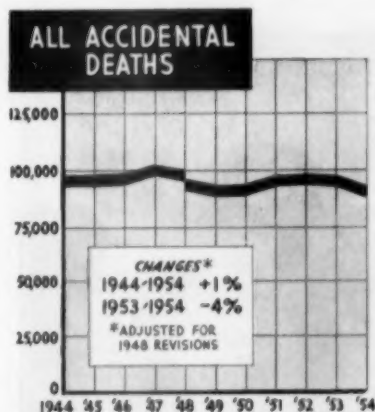
Nonfatal injuries totalled about 1,850,000, compared to 2,000,000 in 1953. Permanent impairment cases numbered approximately 75,000.

Employment in all industries during 1954 was about 1½ per cent less than in 1953. In manufacturing alone, employment decreased 7 per cent.

Accident rates cannot be computed at this time on a national basis, but preliminary information indicates that the all-industry frequency rate probably was lower than in 1953. Nonfatal injuries, as noted above, decreased 7 per cent. Employment was down 1½ per cent and average hours worked also were down 1½ per cent—a total of only 3 per cent reduction in exposure.

## Accident Costs

Wage loss, medical expense, and the overhead cost of insurance for work accidents in 1954 amounted to \$1,650,000,000. The so-called "indirect" costs are estimated at about \$1,500,000,000, including such items as time lost by workers, other than the injured, interference with pro-



duction schedules, property damage, and partial disability due to accidents which did not result in lost time. Total costs thus were about \$3,150,000,000.

## Off-the-Job Accidents

In addition to the work accidents, the nation's productive capacity was lowered by off-the-job accidents of workers. The 1954 death toll from these accidents was approximately 30,000 and the injury total about 2,400,000. Accidents to workers, on and off the job, thus totalled 44,000 deaths and 4,250,000 injuries. The time lost during the year from these accidents, and from less serious injuries and indirect losses, amounted to approximately 285,000,000 man-days.

## Industrial Commission Records

Deaths reported to Industrial Commissions in 22 states during 1954

totalled 6,809, or 5 per cent fewer than were reported in 1953. Increases of 1 to 14 per cent were recorded in 10 states, but decreases of 6 to 35 per cent occurred in 12 states.

	1954	1953	Per Cent Change
Totals for 22 states	6,809	7,196	-5
Alabama	97	93	+4
Arizona	88	89	-1
California	990	1,074	-8
Connecticut (11 mos.)	39	57	-32
Florida	153	163	-6
Georgia	171	162	+6
Idaho	61	66	-8
Illinois (11 mos.)	288	335	-14
Kentucky	67	80	-16
Massachusetts	577	561	+3
Missouri	71	69	+3
Nebraska	80	74	+8
New York	1,735	1,716	+1
North Carolina	145	130	+12
Oregon	146	128	+14
Pennsylvania	753	862	-13
South Carolina	72	93	-23
Texas	544	615	-12
Virginia	185	235	-21
Washington	208	206	+1
West Virginia	253	232	+9
Wisconsin	116	156	-26

## Railroad Accidents

Deaths of railroad employees on duty, except those occurring more than 24 hours after the injury, numbered 149 in the first 9 months of 1954, a decrease of 34 per cent from 1953. Injuries with more than 3 days' disability numbered 12,182, or 17 per cent fewer than in 1953.

## Coal Mine Accidents

Deaths in coal mine accidents during 1954 totalled 395, or 14 per cent less than in 1953, according to a preliminary report of the U. S. Bureau of Mines. This is the lowest annual death total on record. Falls of roof or face resulted in 217 deaths, or more than half of the total. Haulage accidents ranked second, with 91 deaths. All other types of accidents caused only 87 deaths in total.

## Fire Loss

The 1954 total of property destroyed by fire was \$871,000,000, according to the National Board of Fire Underwriters. This was 4 per cent less than the comparable 1953 total. In 1953, over half of the loss from building fires was in industrial and business establishments.

## THE NATIONAL ACCIDENT FATALITY TOLL

	1954	1953	Per Cent Change
All Accidents	91,000	95,000	-4
Motor-vehicle	36,300	38,300	-5
Public non-motor-vehicle	16,000	16,000	0
Home	28,000	29,000	-3
Work	14,000	15,000	-7

Note: The motor-vehicle totals include some deaths also included in the work and home totals. This duplication amounted to about 3,309 deaths in both 1954 and 1953. All figures are National Safety Council estimates.

# RADIOACTIVE MATERIALS IN INDUSTRY

For tracer and inspection operations, radioactive materials can be used safely with comparatively simple and inexpensive precautions.

"Hot" laboratories with severe exposures need more elaborate measures



Three-dimensional television makes it possible to watch hazardous operations from a safe distance. This installation was developed at Argonne National Laboratory of the Atomic Energy Commission through the cooperation of Allen B. Du Mont Laboratories, Inc., and is used in the handling of radioactive materials.

**RADIOACTIVE MATERIALS** are being used increasingly in industry and in medical diagnosis and treatment. Their most common use is in the form of radioactive isotopes which are simply radioactive varieties of familiar substances, such as carbon, sulfur and iodine.

The radioactive form of a material cannot be distinguished chemically from its non-radioactive form, so a radioactive isotope can be used to tag a material and to follow its route in chemical reactions.

The uses of radioactive materials in industry are numerous and important. A sensitive and accurate type of thickness gauge, which does not damage materials is actuated by a radioactive source. Metal wear inside motors can be studied without tearing them down when bearing surfaces contain radioactive iron.

Other uses of radioactive materials are: mapping sewers and locating obstructions in pipe lines;

serving as a level gauge to indicate the height of a liquid without any mechanical connection; studying synthetic detergents and methods of preserving telephone poles.

Radioactive materials emit one or more of three types of radiation—alpha, beta and gamma. Alpha, the least penetrating of the three, is completely absorbed by the outer layer of the skin. External alpha exposure is not a serious hazard. However, alpha-emanating materials do present a hazard if ingested or inhaled where they would come in contact with internal body tissue.

Beta rays are more penetrating than alpha rays but they do not penetrate very deeply. The principal danger is in exposing the entire body to radiation from a strong beta source.

Gamma radiation is the most penetrating. In sufficient dose it may affect the skin and the internal blood producing and reproductive organs.

Protection against radiation may be achieved by shielding, by ventilation, and by controlling distance



Beta ray gauges are used at Butler Works of Armco Steel Corp. to measure the thickness of steel strip. Use of these gauges calls for radiation checks with Geiger counters. (Courtesy Armco-Operator)



from the source of radiation and limiting the time of exposure. The amount of shielding used against gamma, the most penetrating type of radiation, depends on the intensity of the radioactive source and the energy of the rays.

Microcurie amounts, equal to a few millionths of a gram of radium, can be handled safely with ordinary laboratory apparatus and ventilation. Laboratory workers avoid unnecessary handling of the container and use short tongs and probes to keep their hands away from the work. Where tracer scale operations are sufficiently prolonged to build up a significant radiation exposure, a light shield is used.

Shields are needed when the radioactive material amounts to millicuries—equal to a few thousandths of a gram of radium. Exposure of the whole body is involved. The operator may erect a course or two of lead bricks at the front of a hood or bench to shield most of his body from the rays.

Where the length of exposure and amount of radiation require it, the whole body may be protected by using instruments that curve around or over a head-high barrier. A mirror above the bench gives the operator a view of the work.

For some operations, closed circuit television permits viewing the work from a safe distance.

When the amount of radioactivity nears the curie level, or a lower level when the work is prolonged, permanent shields are provided with special apparatus for manipulating and watching the work. The set up is usually shielded at the sides and rear as well as at the front. Thickness of the walls ranges up to several feet of concrete.

Remote controls and safety interlocks are used in radiochemical laboratories. Remote controls take advantage of the principal that radiation diminishes with distance from the source—a person is four times as safe when two feet from the source as when one foot away if there is not too much secondary radiation. Safety interlocks are provided to prevent exposure to sources of radiation when hot processes are in operation.

Medical supervision is a very important part of the program. Pre-employment examinations should include complete blood studies, urinalysis and chest examination. Individuals working with radioactive materials are re-examined at regular intervals or when there is suspected ingestion or inhalation.

## FRINGE BENEFITS

**E**VERYONE is familiar with "fringe benefits" although it's questionable whether many can tell how much his share of such benefits amounts to per hour and per year. In fact, it's questionable how many can tell what makes up the "fringe benefits" he has.

Such things as vacations, holidays, sickness benefits, pension plans, jury and military service compensation, group insurance, social security and tuition refunds can add up to a fairly respectable sum. And, that ain't all!

Technological advances in production and safety over the years have provided "fringe benefits" of increasing value—in that injury and death rates of employees have been steadily reduced. In many industries you are safer at work than off the job.

Development of better machine and equipment safeguards; development of better personal protective equipment; improvement of plant design features; improved training aids and techniques; increased knowledge of employee psychological factors; improved communications and public education. All these factors have contributed toward providing the American worker with the finest working conditions, and also the safest working conditions.

How many of us are still alive or still in one piece today, as a result of these "fringe benefits," none of us knows. However, it is by being interested in improvement and advancement that we enhance our own position and our "fringe benefits" as well.

ROBERT D. GIDEL, *Senior Consulting Engineer, Industrial Department, National Safety Council.*

**Personnel monitoring.** Employees engaged in these operations wear calibrated x-ray film badges on the outsides of their laboratory coats. These are collected weekly for development and a record of badge readings is kept.

For those who work with more than 100 microcurie amounts of gamma radiation, it is common practice for each employee to carry two pocket ionization chambers.

**Laboratory monitoring** of equipment and areas is done by means of an ionization chamber type of survey meter and a Geiger counter.

Laboratory coats, trousers and shoes and the operators' hands are monitored daily. When garments show activity beyond a specified level they must not be sent to an outside laundry.

With these devices and procedures it is possible to determine the radiation dose to any person. This makes it possible to adjust conditions to keep the dosage within conservative tolerance levels. Levels now in use are based on the results of many years experience in the use of radium and x-rays and were recommended by the National Bureau of Standards and the American Standards Association.

The tolerance levels used for employees in plants of the Atomic Energy Commission are kept low because a person may be exposed day after day and year after year for his entire working life. An individual who is exposed to radiation only on rare occasions can take as many as 500 times the daily tolerance level without serious effects.

### The Electronic Age

The use of electronic equipment in industry, at the present, doubles every five years. Industry is currently spending \$260 million a year. This figure may reach \$940 million by 1960, if the present trend continues.

A ray of modulated light controls a 20 foot shear in a Cleveland plant, keeping fingers away from the blade and hold-down clamps.

Radio isotopes from AEC reactors were requested by more than 1800 companies and institutions in 1954, a substantial increase over any previous year. This may well be a new frontier for safety engineering in the making.

—Electronic Control Corp.  
"Electronics for Safety"



Aerial view of the Taconite Project of the Erie Mining Company.

This Jumbo Poster is one of the many reminders displayed at the project.



## Everybody's Working for Safety at The Taconite Project

By GLEN HOSTETTER

**THE QUEST** for Taconite and other low-grade iron ores is a great chapter in the annals of American mining engineering. It is being written at this moment in northern Minnesota and Michigan. The Taconite project of the Erie Mining Company, financed entirely with private capital, is one of the largest construction jobs ever undertaken.

Here on the Mesabi range is a dependable source of iron ore. Taconite rock contains only 30 per cent iron and cannot be used in its natural state in a blast furnace, but mining companies have developed methods of extracting the iron.

Taconite is extremely hard, and new methods had to be devised for drilling and blasting. The iron particles are finely dispersed, and the

GLEN HOSTETTER has been Safety Director for Taconite Project, Erie Mining Company, Aurora, Minn., since April 1954. Previously he had wide experience in accident prevention with the U. S. Corps of Engineers and the Atomic Energy Commission.



A management conference. Left to right: J. W. Fitzpatrick, labor relations director, Foley Constructors of Minnesota; Glen Hostetter, safety director, Taconite Project; L. E. Johnson, executive assistant, Taconite Project; Dan Young, resident superintendent, Foley Constructors of Minnesota; Stewart Carpenter, construction engineer, Anaconda.

rock must be ground to the fineness of flour before the iron can be separated. The process of separating the two elements is called "beneficiating" or "concentrating." This was first attempted in 1914, and later in 1924, but little was actually accomplished until two decades ago, when intensive research began into

a commercially practical method for beneficiating Taconite. One of the pioneer groups was at the University of Minnesota, under the direction of Professor E. W. Davis. Another was the group that eventually formed the Erie Mining Company.

The combined efforts of many companies, thousands of men and



Powder men and drillers are furnished with hard hats, winter liners, respirators, and eye protection. Because of the remoteness of the job and present scarcity of water, dry drilling is necessary. Exhauster with flexible metal hose connections removes dust.



Everybody on the Taconite Project wears a hard hat. The sign reminds them of the regulation and the guards make sure that it is obeyed.

hundreds of millions of dollars, all have a part in the Erie Commercial Taconite Project. Erie headquarters, a few miles outside of Aurora, Minn., began operations in November 1953. Actual excavations for the plant site, railroad and harbor were begun early last year.

Erie Mining Company is owned by Bethlehem Steel Corp., The Youngstown Sheet and Tube Company, Interlake Iron Corp. and The Steel Company of Canada, Limited, and operated by Pickands Mather and Company.

**The safety program.** The safety director and his three associates are responsible for the safety of every man on the project.

The program is divided into three areas of control. Howard Bayless is in charge of fire protection for the entire project. Byron Wagner's duties include safety supervision of the mill, diversion works, town sites and trailer camps. Sam Booner is in charge of the program for the harbor and railroad.

Periodic safety surveys are one of the department's many jobs. Others include establishing safety procedures, making inspections, furnishing posters, such as those of the National Safety Council, preparing safety bulletins, arranging for meetings, and establishing fire and security regulations on a job that now involves more than 3,500 men and dozens of contractors and subcontractors.

The basis for the safety program on the Project is the Minnesota State Safety Code and the Associated General Contractors' Manual

of Accident Prevention. All contracts have a safety clause which states that the contractors and subcontractors will comply with the safety rules of the State of Minnesota and the Erie Mining Company.

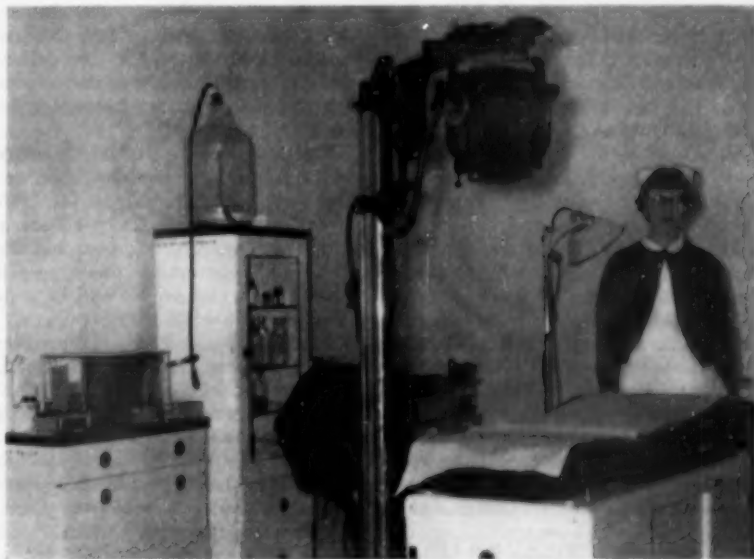
Some of the companies have their own safety programs, working in conjunction with the writer and his associates. One of these is Foley Constructors of Minnesota, whose Safety Department is under the direction of Dale Vosberg.

**The Turtle Club.** Head protection is one of the important safety measures on the project and the value of hard hats has received helpful publicity

nationally through the Turtle Club, an organization composed of men whose lives have been saved by wearing hard hats.

Recently, John Gruden, a carpenter's helper, became the 425th member of the club, and the first member on the project. He was working on concrete forms when a 12-foot piece of 4 x 4 lumber fell 18 feet, demolishing his hard hat. He was uninjured and the only time he lost from the job was while he got a new hard hat. He was received into membership in the headquarters office of Foley Constructors of Minnesota.

A new member of the Turtle Club  
—To page 121



Mrs. Barbara Neubauer, R.N., on duty at the modern dispensary at Taconite Project plant site. Nurses are on duty at all times at both dispensaries.



# Wire from WASHINGTON

By HARRY N. ROSENFELD

Washington Counsel, National Safety Council



DURING THE FIRST MONTH of the current Congressional session, the major developments were the Regular and Special Messages from the President to the Congress, the introduction of bills for referral to Committees and the organization of the committee structure of the Congress.

## Highways

Owing to the Formosa crisis, the President's Special Message on Highways was deferred for several weeks. However, the report of the President's Advisory Committee on a National Highway Program (the so-called "Clay Committee") was issued.

The Clay Committee called for a 10-year national highway program, at a total cost of \$101 billion. Toward this sum, it was recommended that the Federal government contribute \$31 billion, and that State and local governments contribute \$70 billion.

The recommended Federal expenditures would increase the Federal share from a current 19 per cent to a proposed 30 per cent of the total cost of highway construction programs. In general, the funds were to be used not for constructing new highway mileage but rather to replace and repair existing roads. Priority was suggested for the interstate highway system, with \$27 billion proposed for this purpose (of which amount \$25 billion was to come from the Federal government's contribution).

The President's Advisory Committee proposed, as a means of financing the Federal share of the program, that Congress set up a Federal Highway Corporation, which would issue some \$20 billion in 30 year bonds earning 3 per cent interest. The Clay Committee rejected any earmarking of Federal gas and oil taxes, and proposed that the bonds be retired by direct Congressional appropriations to the proposed Corporation.

The total cost of these \$20 billion in bonds would amount to some \$32 billion, including interest. The Com-

mittee proposed that these bonds not be included in the Federal debt limit. It made no suggestions as to the methods of financing the contributions from the States and local governments, although limited approval was given for toll roads.

One of the basic justifications given by the Clay Committee for its proposals was that it would "prevent tragic and costly accidents." Its report said:

"In any consideration of road deficiencies, the safety factor must assume large importance . . . The death rate on high-type, heavily traveled arteries with modern design, including control of access, is only one-fourth to a half as high as it is on less adequate highways."

Two United States Senators have expressed opposition to the proposed method of financing, Senators Robertson and Byrd. Senator Byrd, who is Chairman of the Senate Committee on Finance, called the proposed financing plan "thoroughly unsound," and charged that its proposals violate financing principles, defy budgetary control and evade federal debt law," as well as being harmful to states rights. As an alternative plan, Senator Byrd proposed the reduction of the federal gas tax from 2c to 1½c per gallon, thereby enabling states to impose gas taxes and use the revenue for highway purposes.

The President's Budget Message to the Congress recommends an appropriation of \$680 million for 1956, as authorized under the 1954 Federal Aid Highway Act, but does not include any amount for the proposed 10-year program which will be separately dealt with.

Francis V. du Pont resigned as U. S. Commissioner of Public Roads to assume the post of Special Assistant to the Secretary of Commerce in developing the President's 10-year National Highway program. He was succeeded in his post as Commissioner by the former Deputy Commissioner, Charles D. Curtiss.

Among the various bills introduced were S. 736 (Kilgore, Neely) and H. R. 3804 (Staggers) to provide

for a transcontinental highway system, H. R. 2127 (Fallon) and H. R. 3440 (Jones) to amend the Federal Aid Act, S. 310 (Barrett) to require safety belts in automobiles. H. R. 3129 (Moulder) requiring certain motor vehicles to be equipped with front and back bumpers, and H. R. 3433 (Harden) to establish a uniform national system of turning, starting and stopping signals and highway signals.

## Air and Water Pollution

The problems of air and stream pollution have become a matter of great concern. In his Special Message on Health, the President dealt specifically with these issues. He proposed stepping up research on air pollution, and recommended an increased appropriation to the United States Public Health Service for research into causes and methods of control.

The President also recommended greater assistance to the states for water pollution control programs, and urged the indefinite extension of the Water Pollution Control Act which is scheduled to expire June 30, 1956. To accomplish this latter purpose, the Secretary of Health, Education and Welfare sent to the Congress a draft of proposed legislation. Such a bill was introduced in the Senate, S. 890 (Martin, Chavez, Duff, Knowland, Kuchel, Wiley), and in the House, H. R. 3426 (Dondero). S. 982 (Neely) would also amend the Water Pollution Control Act. S. 928 (Kuchel, Knowland, Martin, Duff) would extend the act to include air pollution as well.

Considerable interest has been shown in the Congress on this subject, not only in speeches on the floor of Congress, but also in bills introduced along two lines. First, there have been bills designed to provide for study of the causes and methods of control of such air and water pollution: H. R. 2129, 2888, and 3680 relate to air pollution, and H. R. 116 would set up a select committee of the Congress to study air pollution. A second group of bills



would provide tax encouragement to treatment works for avoiding pollution, by providing for an accelerated amortization rate for the costs involved: S. 917 (Martin, Duff, Knowland, Kuchel, Potter, Wiley), H. R. 2547-3556 (inc.) H. R. 3662.

#### Industrial Safety

The President's Budget Message recommended an appropriation of \$2 million to cover legislation, which he intended to propose, to aid states in further developing industrial safety programs. The President said: "The States will be encouraged to intensify their industrial safety programs to decrease accidents."

In addition, the President's Budget includes funds for studies to enable the U. S. Department of Labor to promote more effective safety programs and to assist states in improving their workmen's compensation standards. On this latter score, the President said: "Workmen's compensation programs—an important facet of the industrial safety problem—have lagged behind other social insurance programs in recent years."

The Budget Message also indicated that the President proposed to recommend legislation and appropriations to cooperate with the State of Pennsylvania in providing facilities for surface water drainage in the anthracite coal region. S. 483 (Duff, Martin), H. R. 2391 (Flood) and H. R. 2444 (Walters) would provide temporary measures of flood control and anthracite mine drainage.

The President also proposed a reduction of Federal payments for forest-fire control on non-Federal lands because, he stated, the States are assuming greater responsibility in this area. H. R. 3756 (Dawson) would authorize reciprocal fire-protection agreements between U. S. agencies and private or public organizations in fire-fighting activities.

Among other bills introduced were: H. R. 2399 (Gross) requiring the illumination of freight and other unlighted railroad cars; H. R. 3721 (Young) requiring the labeling of blasting caps to indicate that they are dangerous; and H. Res. 38 (Multer) to create a Select Committee of the Congress to investigate accident, health and hospitalization insurance companies.

#### Aviation

In his Budget Message, the President recommended increased appropriations to the CAA for expansion and improvement of air navigation facilities and for more radar traffic control equipment "as a step to

maintain high standards of safety." The Budget also includes increased amounts "for Federal participation in a study of medical standards for airmen and the development of a positive program for shifting responsibility for safe operating practice to the industry." The President said: "With the increasing maturity of civil aviation, the Federal government soon should be able to reduce substantially its safety promotion and enforcement activities without affecting the present high level of safety."

During 1954 the Senate Committee on Interstate and Foreign Commerce held extensive hearings on S. 2647 (McCarran) which was an omnibus bill to rewrite the Civil Aeronautics Act. The Committee released its study and analysis of this testimony, with a proposed substitute bill, which Senator Bricker introduced (S. 308). The Senate Committee opposes the creation of an independent Air Safety Board; "the excellent safety record under the existing Civil

## The Council's Library Is at Your Service

THE National Safety Council was organized over 40 years ago to provide a center where safety ideas could be collected and exchanged. The library was established so that there would be one focal point within the Council where this information could be received and dispensed. During this time a wealth of information has been accumulated as a result of the intense interests of various groups. Also, during this time many have profitably used the library.

The National Safety Council hopes to make its library even more serviceable to those interested in accident prevention. It expects to continue to grow as a center for the receipt and dissemination of safety data, techniques, and ideas—To serve as a clearing house which can provide the answers or the source of the answers to any safety problem which may arise.

If you have solved a safety problem with the help we have sent you or by some original plan or technique of your own, please send us a resume of the problem and its solution. If you have written a paper or made a special study carrying safety progress forward we welcome your contribution.

Information of this type is most helpful to others faced with the same or similar problems. The library will be happy to receive and pass on to others any and all information its friends may furnish.

Aeronautics Act is strong recommendation for the continuance of the safety regulatory scheme now in effect." However, while concluding that it was unnecessary to change this basic scheme, the Committee considered certain changes proposed in various details of safety regulation.

The Air Coordinating Committee announced that it would organize a joint Aviation and Broadcasting committee to study the legal, safety and economic issues involved in the joint use of the airspace between aviation and broadcasting industries, with specific reference to the problems of very tall antenna towers proposed for construction. Two bills also dealt with this problem, proposing to limit the height of such towers: H. J. Res. 139 (Harris), H. J. Res. 139 (Hinshaw).

Other bills included: H. Res. 18 (Boggs) to create a select committee of the Congress to investigate the C. A. B., and H. J. Res. 191 (Bosch)

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(Fiction)

*His product looked good—his line was convincing. What was lacking?*

## Blocked Sale

By BILL ANDREWS

March 1, 1955

The salesman was talking fast and well.

His pitch was for a two-hand punch press control with a couple of new wrinkles to make it harder to beat. It looked pretty good to me.

On my desk was a postcard with a picture of a bathing beauty on the seashore. On the other side was written "Wish you were here, so I could sell you a fat order. See my ad in the Equipment Issue of NATIONAL SAFETY NEWS. Love, Max." The postmark was Miami.

I took the salesman who was not in Florida out to our punch press department, and he showed me how the device would be attached to our equipment. Apparently he knew presses.

If it had been a smaller item, I think I would have let him jam the pen into my hand and signed his order. But it came to a pretty substantial amount, so I said I'd keep his brochure and let him know.

He didn't like that, and showed it. "Look," he said, "let's close this now. I'll pay for a phone call to any of my customers who are using the device, and let you talk to their press foreman so you can get their reaction. That's the best evidence I know."

I shook my head, and he saw that I meant it. He put his pen away and relaxed.

"Tell me something," he said.

"What do you want to know?"

He smiled. "Man to man, what's wrong with my approach? I know the product's good—I didn't tell you, but I had eight years in press design work at Localate's. I've done pretty

well on this trip dealing with superintendents. But I've hit three other big outfits like yours with professional safety engineers making the decision, and I've sold only one of them. What's the block?"

I began to like the guy. I know how dependent any safety man is on the help of good peddlers, and I like a guy who knows he doesn't know it all and wants to learn.

So I took a minute to work out reasons clearly in my own mind, since I had actually been acting more or less instinctively and by impulse.

At last I said, "Part of it is just automatic caution, I guess. Your device is new. I haven't dealt with your firm. I don't know you. None of those is reason for refusing your product, and I haven't refused it. But those reasons are good enough to make me want to take some time to look into the subject further, try to uncover a hidden bug in your solution of the problem, and maybe check some of your customers."

"Then maybe some competitor of yours is coming out with something better, and I want to look into that."

He interrupted with, "That last is something that would always be true, isn't it? Surely you don't indefinitely hold off a purchase because tomorrow somebody might market something better."

"Right," I said, "But you hit me at a time of the year when I can expect announcements of new devices."

He looked a little puzzled. "Why this time of year?" he asked.

I tossed him Max's postcard. He read it with a blank look.

I went on, "No, you wouldn't get the point. Max is a competitor of yours—whenever you get into the safety field. He's a good peddler, and a good safety man."

The salesman frowned, "You mean he has all your business sewed up?"

"No, not by a long shot. But Max has been around a long time, and he knows the field better than most safety engineers. I get a lot of good out of him, and he gets a good piece of business from me. But not all of it—not even half of it."

He shook his head. "Then I don't think I get what you're driving at. Surely you aren't going to wait to get a competitor's okay on my product, are you?"

"No," I replied. "You miss the point. Max comes into this because he is the wise peddler—and incidentally his own employer. You'll note that Max, at the moment, is basking in sunshine and bathing beauties. But he has his advertising lined up and he'll be back shortly to cash in on it."

"I don't see where the advertising or Max's vacation come into the picture," the salesman said.

"This way," I said. "The best single group of safety equipment ads appear each year in the March Equipment issue of the NATIONAL SAFETY NEWS. I'll look it over when it arrives in a few days—look it over carefully. Then I'll file it as a reference book. I expect to find anything new and good advertised."

He was still a little puzzled. "Just why this particular issue of this particular magazine?" he asked.

"Three reasons," I said. "First,  
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# Women Are on the Job

**Generalizations about women are often wrong but both law and custom dictate extra precautions where they are employed**

"WHAT'S SO NEW about women working?" any housewife might ask. And there is still much exacting work around the home, although modern gadgets have lightened some of the backbreaking chores.

Women, in fact, have been working a long time. In the old world and in the pioneer days of this country they worked in the fields with the men. They formerly worked in coal mines. And today in some countries they are doing manual labor rebuilding cities wrecked by war. Most of the employees in the first textile mills were women.

Two world wars left women firmly established in industry. Men have accepted that fact—often reluctantly. Maintaining safe and healthful working conditions for them has become a problem which is attracting the attention of management, state and municipal government and labor organizations. Public concern is not only for the women themselves but also for unborn children. And disfiguring injuries are always more tragic for a woman.

During the emergency of war time women worked as riveters, welders, truck drivers, lathe operators, and many other occupations once considered unsuitable for women.

There have been many generalizations about women in industry—many of them inaccurate. And the situation has perhaps been complicated by long-cherished male prejudices.

All states now have laws regulating some aspects of the employment of women. These laws concern such things as hours of work, weights that may be lifted, exposure to toxic materials, sanitary facilities, prohibited occupations, and employment during and after pregnancy. The company employing women for the first time should become acquainted with the state laws.

Women are generally supposed to excel in work requiring care, patience, alertness, dexterity and skill. Many of them do, of course, but job placement should not assume that every woman has these qualifications.

The important points to remember are that women have less physical strength than men and that many

jobs must be adjusted because of their physical characteristics.

Accident records compiled for both men and women show no consistent pattern of higher or lower rates for either group.

Evidence indicates that non-pregnant women are no more susceptible than men to industrial poisons.

Women are supposed to be more sensitive to skin irritants. Investigation, however, shows that type of skin, rather than sex, is involved in skin infections. Also personal habits of cleanliness vary as widely among women as among men.

## Placement Suggestions

These suggestions for successful placement of women workers are offered by the Women's Bureau of the U. S. Department of Labor.

1. Survey jobs to decide which are suitable for women.

2. Adapt jobs to fit smaller frames and lesser physical strength of women. (Generally about 60 per cent the strength of men.)

3. Provide service facilities in the plant to accommodate the anticipated number of women.

4. If the number of women employed justifies it, appoint a woman personnel director and the head of a woman counselor system.

5. Select women carefully and for specific jobs.

6. Develop a program for induction and training.

7. Maintain good working conditions.

8. Supervise intelligently.

9. Give women equal opportunity with men.

Many women are injured in machinery accidents. This may be due

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Women need protective equipment, too. In the jobs at Kelly Air Force Base where these women work, safety hats and gloves are mandatory.

# These new Thom McAn safety shoes



▲ Above: #4316, U-wingtip---cool, woven nylon vamp and quarter, leather sole, rubber heel. Steel toe box leather-lined to protect socks.

©1955 Melville Shoe Corporation



▲ Above: #4356, plain-toe blucher in woven, brown leather. Leather-lined steel toe box, leather sole, rubber heel.

Below: #4357, U-wing blucher in embossed, ventilated, brown leather. Steel toe box, leather sole, rubber heel. ▼





# fit two needs: safety on the job—style after work

**T**HESE new Thom McAns give your men both the protection of sturdy steel-toed safety shoes and the comfort and good looks of dress-weight styling. They are a great advance over cumbersome, old-fashioned safety shoes.

There is no need to change these shoes after work. All are styled for after-hours wear. And the three Thom McAns you see on the left-hand page are specially designed for summer wear. They are comfortable as well as safe in hottest weather or working conditions.

Add to these great features, top quality, rugged leather, the extra appeal of Thom McAn's famous money-saving price. You'll see why Thom McAn is so good it's the best-selling shoe in all America.

**Sold Two Ways:** 1. At Thom McAn Stores. 2. Direct to your plant. Send today for details of our money-saving plant-sale plan and Thom McAn's 4-way employee purchase plan—plus descriptions of the Thom McAn Safety Shoe line. Write: Thom McAn Safety Division, 25 W. 43rd St., N. Y. 36.

**Thom McAn**

SAFETY SHOES

A Division of the Malville Shoe Corporation



▲ Above: #4310, brown moccasin-style slip-on. Leather-lined steel toe box. Springy Nitrocrepe sole and heel.

Below: #1302, black U-wing oxford. Steel toe box, leather sole, rubber heel. (Also in brown—#4302.) ▼



# GREEN CROSS NEWS



## Activities of Local Safety Councils and Chapters

By TOM A. BURKE, Assistant Director, Western Region, NSC

### Visits Western Chapters

General Manager George C. Stewart of NSC made a quick ten-day swing to the West Coast in late January, visiting chapter administrators, officers and members, to get a first-hand picture of community safety in action.

In Spokane, the first stop, he met with the officers and board members of the Spokane Area Safety Council and from there went to Seattle for an interesting day with members of the executive committee of the Seattle-King County Safety Council and Manager Paul Seibert.

In Oakland, he met with presidents and managers from Northern California chapters, with members of the Western Region Staff from San Francisco. He attended and spoke at a luncheon given in his honor by the San Francisco Chapter and also was a speaker and special guest at the Eastbay Conference of Mayors.

From San Francisco, Mr. Stewart flew to Los Angeles where he attended the Annual Meeting of Members of the Greater Los Angeles Chapter on the evening of January 31, and brought official NSC greetings to that group. He returned to Chicago on Feb. 1. Mrs. Stewart accompanied him on the trip.

The Northern California chapter managers who met with Mr. Stewart in Oakland were Iver Larson, San Francisco; Clinton W. Dreyer, Eastbay; Frank Enos, Sacramento; Lovilla Lalor, Stockton; and Walter Lunsford, Fresno.

### Heads L. A. Chapter

James T. Blalock, vice-president, Pacific Indemnity Company, Los Angeles, long a vigorous and able exponent of safety in all fields of activity, is the new president of the Greater Los Angeles Chapter, NSC. Mr. Blalock was installed at the Annual Meeting of Members, held Monday evening, January 31, at the Ambassador Hotel,

Los Angeles. The retiring president, L. W. Van Aken, was honored for his progressive accomplishments and able leadership during the past four years, by approximately 1200 members and friends of safety.

A brilliant array of Hollywood stars participated in the entertainment. The featured address of the evening was given by Mrs. Ivy Baker Priest, Treasurer of the United States, who delighted her audience with her charm of manner and stories of her experiences behind the scenes as chief custodian of Uncle Sam's cash box.

### Peck Goes to Kalamazoo

Stanley Peck, for the past several years assistant to Manager Harold Lillie of the Lansing Safety Council, has resigned his post at the Michigan Capitol to become director-secretary of the Kalamazoo Safety Council. Before entering the safety field, Peck did extensive promotional and publicity work. With his Lansing experience in all fields of community safety, he is well qualified for a successful career with the Kalamazoo Council. He succeeds Mac Gearhart who resigned at Kalamazoo some time ago to manage the Spokane Area Safety Council.

### Clever Sales Adaptation

The colorful NSC industrial booklet, *What's in It for Me?* found a new and ingenious use as sales appeal for attendance at the 1955 Minneapolis Safety Conferences. Manager Forst Lowery of the Greater Minneapolis Safety Council, sponsoring the conferences, used the booklet as the cover for his eight-page program of the industrial sessions, stitching in his schedules as a supplement to the NSC booklet and using a special cover, announcing his course, with a cut-out showing the upper part of the NSC pamphlet and emphasizing just the title.

The Conferences consisted of gen-

eral sessions, occupational health—nurses, machine shop, management, mill and elevator, public utilities and foundry, each with three sessions scheduled for January 26, February 22 and March 28. The program contained the following paragraph: "Your Committee thought the National Safety Council booklet *What's in It for Me?* was so good that we wanted everybody attending the Conference to have one."

### Stockton Awards Presented

The San Joaquin County Safety Council (Calif.) presented 40 awards at its annual banquet and meeting, held at Stockton January 18. Definite progress has been made in the Inter-Plant and Industrial Contests since these two projects were organized in the Fall of 1953. In addition to plaques and certificates given by the Chapter to its industrial and fleet contest winners, local public interest awards were given to six leaders who have been active in the Council's work, along with two special awards given to those persons who best represent "Mr. Safety of 1954" and "Mrs. Safety of 1954."

Special awards were also given for the best 1954 and 1953 "Operation Safety" programs. A. C. Blackman, Chief of the California Division of Industrial Safety, was the dinner speaker, while Tom A. Burke of the Western Region office presented the industrial, fleet and public interest awards.

### Diabetes and Accidents

The Fresno County Diabetes Association (Calif.) has launched the area's first diabetes detection drive in the hope of finding and aiding unsuspecting diabetics. The group plans to hold special drivers' license holders for those suffering from the disease. Earl William Brawley, a driver improvement analyst for the Fresno area, representing the

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# COMING EVENTS



## Mar. 8-9, Philadelphia

Twenty-first Annual Philadelphia Regional Safety and Fire Conference and Exhibit (Broadwood Hotel). Walter W. Matthews, managing director, Philadelphia Safety Council, 17th and Sansom Sts., Philadelphia 3, Pa.

## Mar. 21-22, Boston, Mass.

Thirty-fourth Annual Massachusetts Safety Conference (Hotel Statler). Sponsored by the Safety Councils of Massachusetts. Bruce Campbell, manager, Massachusetts Safety Council, 31 State St., Boston.

## Mar. 21-22, Houston, Texas

Annual Texas Safety Conference (Rice Hotel). J. O. Musick, general manager, Texas Safety Association, Inc., 830 Littlefield Bldg., Austin, Texas.

## Mar. 21-23, Los Angeles

Second Annual Southern California Safety Congress and Exhibit (Ambassador Hotel). Joseph M. Kaplan, secretary-manager, Greater Los Angeles Chapter, NSC, 610 South Main St., Los Angeles 14.

## Mar. 22, Madison, Wis.

Wisconsin Cannery Safety Institute.\*

## Mar. 29-31, Pittsburgh, Pa.

Thirtieth Annual Western Pennsylvania Safety Engineering Conference and Exhibit (Hotel William Penn). Harry H. Brainerd, executive manager, 605 Park Bldg., Pittsburgh 22, Pa.

## Mar. 30-31, Indianapolis

Eighth Central Indiana Safety Conference and Exhibit (Claypool Hotel). Jack E. Gunnell, Indianapolis Safety Council, 320 N. Meridian St., Indianapolis 11, Ind.

## Mar. 31, Apr. 1, Kansas City, Mo.

Central States Safety Congress (Municipal Auditorium and President Hotel). George M. Burns, director, Kansas City Safety Council, 419 Dwight Bldg., Kansas City, Mo.

## Apr. 4-5, Toronto, Ont.

Industrial Accident Prevention Associations, Annual Conference (Royal York Hotel). R. G. D. Anderson, general manager, 90 Harbour St., Toronto 1, Ont.

## Apr. 11-13, New York

Twenty-fifth Annual Safety Convention and Exposition, Greater New York Safety Council (Hotel Statler). Paul

F. Stricker, executive vice-president, Greater New York Safety Council, 60 East 42nd Street, New York 17.

## Apr. 13-15, Clarksburg, W. Va.

West Virginia Safety Council, Inc., Annual Conference and Exhibit (Stone-wall Jackson Hotel) Cecil Dodd, conference chairman, Weirton Steel Co., Weirton, W. Va.

## Apr. 19-20, Fort Wayne, Ind.

Northeastern Indiana Safety Conference and Exposition (Chamber of Commerce Building). Ivan A. Martin, manager, Safety Council, Chamber of Commerce of Fort Wayne, Fort Wayne 2, Ind.

## Apr. 19-21, Niagara Falls, N. Y.

Fifteenth Western New York Safety Conference, in cooperation with the American Society of Safety Engineers (Niagara Hotel). Patsy E. Giamondi, executive secretary, 1436 Delaware Ave., Buffalo 9, N. Y.

## Apr. 26-28, Grand Rapids, Mich.

Twenty-fifth Annual Michigan Safety Conference (Pantlind Hotel and Civic Auditorium). R. H. Goring, executive secretary, c/o Michigan Bell Telephone Company, Detroit 26, Mich.

## Apr. 26-28, Cleveland

Twenty-fifth All Ohio Safety Congress and Exhibit (Hotel Cleveland and Hotel Hollenden). Headquarters at Hotel Cleveland. A. W. Moon, congress manager, c/o Division of Safety and Hygiene, Industrial Commission of Ohio, Columbus 15, Ohio.

## Apr. 28, Platteville, Wis.

Southwest Regional Safety Conference.\*

## May 2-4, Allentown, Bethlehem, Easton, Pa.

Twenty-eighth Annual Eastern Pennsylvania Safety Conference. Harold A. Seward, secretary-treasurer, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

## May 5-6, Baltimore, Md.

Governor's Safety and Health Conference and Exposition (Lord Baltimore

Hotel). Joseph A. Haller, executive chairman, c/o State Industrial Commission, 741 Equitable Bldg., Baltimore 2, Md.

## May 13, Marinette, Wis.

Fox River Valley and Lakeshore Regional Safety Conference.\*

## May 16-18, Syracuse

Central New York Safety Conference and Exposition. Newell C. Townsend, administrative secretary, Safety Division, Syracuse Chamber of Commerce, 351 S. Warren St., Syracuse 2, N. Y.

## May 17, Madison, Wis.

Rock River Valley Regional Safety Conference.\*

## May 18-20, Winston-Salem, N. C.

Twenty-fifth Annual North Carolina Safety Conference (Robert E. Lee Hotel). H. S. Baucom, safety director, North Carolina Industrial Commission, Raleigh, N. C.

## May 19, Racine, Wis.

Southeast Lakeshore Regional Safety Conference.\*

## May 19-20, Duluth, Minn.

Thirty-first Annual Conference of the Lake Superior Mines Safety Council (Hotel Duluth). John A. Johnson, secretary, 18 Federal Bldg., Duluth 2, Minn.

## June 2-3, Victoria, B. C.

Twenty-first Annual Forest Products Safety Conference (Empress Hotel). Pat Reiten, secretary, Simpson Logging Co., Shelton, Wash.

## June 2-4, Richmond, Va.

Virginia Safety Association, Annual Meeting (Jefferson Hotel). William M. Myers, executive secretary, Virginia Safety Association, Room 302, 1103 E. Main St., Richmond 19, Va.

## June 7-8, Hartford, Conn.

Tenth Annual Conference of the Connecticut Safety Society (Statler Hotel). William G. Willis, manager, National of Hartford Group, 1000 Asylum Avenue, Hartford 15, Conn.

## June 7, Wisconsin Rapids, Wis.

Wisconsin River Valley Regional Safety Conference.\*

## Sept. 15-16, York Harbor, Me.

Twenty-eighth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, secretary, Department of Labor and Industry, State House, Augusta, Me.

## Oct. 17-21, Chicago

Forty-third National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

\*For information about Wisconsin Regional Safety Conferences write R. W. Gillette, exec. secretary-treasurer, Wisconsin Council of Safety, State Office Bldg., Madison 2, Wis.



"But lady, I tell you we have all the latest safety equipment."

# PLANT DESIGN and CONSTRUCTION

**P**LANNING the environment for the worker is the modern approach to the solution of both operating and accident prevention problems. Enlightened management builds the working areas and work facilities around the worker instead of merely placing him in a setting without regard to his needs, capacities and limitations.

If this is not done, is it fair to attribute 85 per cent of occupational accidents to "human failure," as has been done so often?

Industrial engineering has for its objective the efficient use of equipment and human skills without undue hazard or strain on the worker. Among the measures used to accomplish this are:

1. Well-designed layout of work place; scientific selection of work methods.
2. Selection and design of efficient process equipment, machines and tools.
3. Use of mechanical power instead of manual labor wherever possible, as in handling materials.
4. Use of power-driven tools and automatic machines.

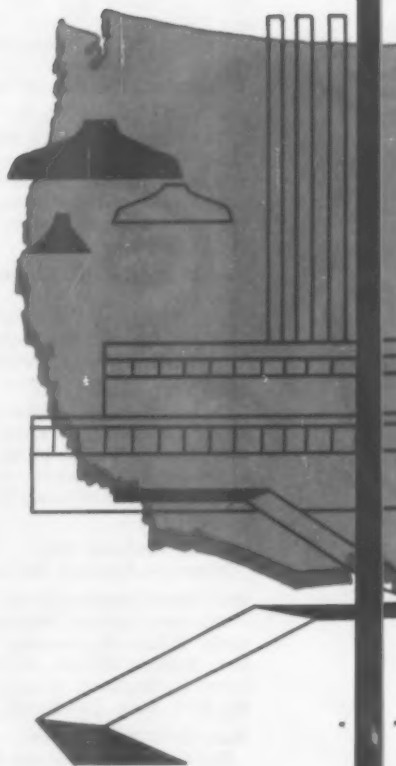
Preplanning the entire plant offers opportunities for a high degree of built-in safety. All possible faults in the working area and in the equipment should be subject to advance analysis. Details are numerous but they are concerned with a few basic principles:

1. Adequate space
2. Safe access
3. Safe maintenance
4. Adequate air and light
5. Adequate services
6. Provision for future expansion

The safety engineer and the industrial hygienist can help by suggesting specific improvements based on analysis of conditions. In a growing number of corporations all plans are checked by specialists in accident prevention and occupational health.

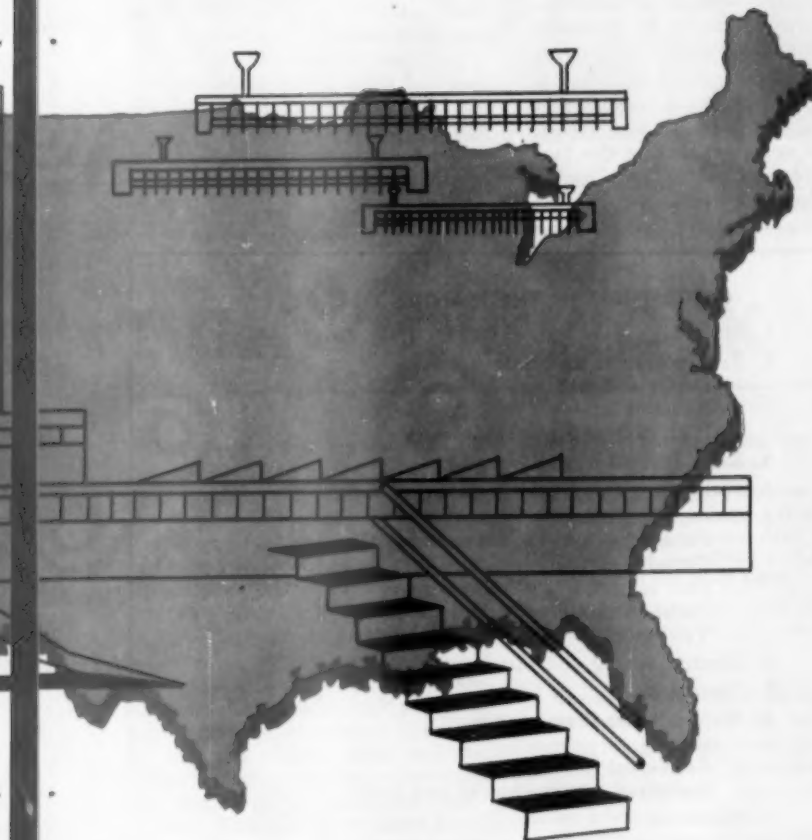
The extent to which design and layout engineers include safety in their planning is often determined by the demands of their clients. Fortunately, most of the large plants built in recent years have been for safety-minded firms who demand safety in the planning.

It is encouraging to note that planning engineers are showing more interest in safety and that safety engineers are showing increased appreciation of operating problems.





# PLANT DESIGN and CONSTRUCTION



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# PLANNING THE PLANT

**CONSTRUCTION** of a new plant offers many opportunities for incorporating features that affect the health and safety of workers as well as efficiency and economy in operation. Attention to these details in pre-planning will avoid many built-in hazards that cause accidents, fires and occupational diseases.

Location, design, and the layout of buildings and equipment are important from the standpoints of operation, maintenance, safety and health.

In many companies, plans are now checked by the safety and medical departments before construction begins. It is usually necessary, and always advisable, to have plans approved by state and municipal officials. Compliance with laws and regulations may save expensive changes in finished buildings.

Remodeling an existing building also offers opportunities for improving working conditions. It has been estimated that some 75 per cent of the industrial buildings in the United States are more than 25 years old and out-of-date according to current standards. Layout, ventilation, lighting, sanitary facilities, and materials-handling methods often can be improved without prohibitive expenditures.

Planning will be required in:

1. Designing a new building.
2. Revision of existing buildings.
3. Transfers from building to building.
4. Rearrangement of departments.

**Visualizing the finished plant.** In planning the layout, each operation can be visualized and provided for. The simplest method is by maps and drawings. More effective are block templates and 2-dimensional templates.

Scale models, 1/4 inch to the foot, provide a realistic 3-dimensional picture of the plant. Various arrangements can be made, and it is possible to study a manufacturing process quickly and easily. Operations may be combined or simplified and the sequence changed.

**"Controlled Conditions."** Many modern plants are independent of the outdoors for light and ventilation. Such advantages are possible with the conventional type of building or with the windowless type. From the standpoint of safety and

employee health, satisfactory conditions are possible with either type.

## General Factors

Type of industry is the major factor in plant requirements. Even plants in the same industry may have individual problems that involve special planning. Among these are use and handling of flammable, explosive or toxic materials, or unusual problems of materials handling and storage.

**The site.** Location of the plant is often influenced by the manufacturing processes. Smoke, odors, fumes, dust and noise are among the factors which may conflict with zoning regulations in some areas.

Proximity of raw materials, markets and labor are prime consideration in choosing the site.

Space for future requirements is another factor. If ample room is available, expansion can be carried on at lower cost and less interruption to production.

The site should provide adequate outdoor storage. Where flammable and explosive materials are stored, legal minimum distances must be maintained between storage facilities and other property.

Fire prevention codes also specify minimum distances between buildings, depending on size, types and occupancies of buildings.

Considerable space for storage of coal and other bulky materials and for disposal of solid wastes are needed in some industries.

Decentralization of industry and erection of new buildings in outly-

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## CHECK THESE IN THE PLANNING STAGE

1. Site
2. Transportation facilities:
  - Docks and wharves
  - Railroad
  - Highways and plant roadways
3. Exits and other wall openings
4. Walkways: floors, stairs, ramps, platforms
5. Storage facilities:
  - Flammable and explosive materials
  - Harmful substances
  - Raw materials
  - Finished products
  - Yard storage
6. Electric wiring and installation
7. Illumination
8. Materials handling equipment:
  - Cranes
  - Conveyors
  - Industrial trucks—power and hand
9. Elevators
10. Boilers and other pressure equipment
11. Ventilation, dust control, air conditioning
12. Fire control
13. Health and Safety:
  - Water—for drinking and sanitary uses
  - Waste disposal
  - Medical and first aid service
  - Personal protective equipment
  - Distribution and repair facilities
14. Personal service facilities:
  - Parking
  - Rest rooms
  - Food service
  - Employment
  - Training

These subjects are discussed in greater detail in other sections of this issue



Fluorescent lighting, large window areas and skillful use of paint contribute to the airy, well-lighted appearance of Delta Air Lines shops at Atlanta Municipal Airport. Upper walls are a restful green with darker green dado. Jib cranes mounted on columns and an interconnecting system of monorails facilitate engine overhaul. (Austin Company photo)

## LIGHT FOR WORK

**INVENTION** of a practical incandescent lamp and improved methods of generating and distributing electric current 75 years ago marked the beginning of a new era for industry and a new way of living for millions. Better light, while only one of electricity's many contributions to human welfare, ranks high among its benefits.

Industrial processes have become complex and there is much precision work, making increasing demands on the eyes. Labor costs and the investment in plant and machinery per worker have expanded enormously. These demands have stimulated research in lighting as a means of providing better and safer working conditions.

Artificial lighting has become so accepted as an element of modern life that its original supplementary character has been largely forgotten. It has become the major source for industry because natural light is not dependable, particularly in winter. Without efficient artificial light sources continuous shift operation would not be practicable.

**Lighting essentials:** To enable the eye to function effectively the lighting system must:

1. Illuminate the work surface to an adequate point of brightness. The worker must see easily and accurately and

work at an efficient speed without eye-strain and undue fatigue.

2. Illuminate the room so that all sections are free from extreme contrasts, harsh glare and deep shadows. It should also contribute a pleasing atmosphere to the work place.

3. Supply light of right color and quality for quick and accurate judging of details.

**Seeing zones.** First is the "task zone"—the job and its immediate surroundings. The work should be lighted adequately, shadows eliminated or diffused, and reflections from surfaces avoided.

The other zone is the rest of the room. When a worker looks up from his work, he should not face glare from lighting fixtures or from a bright wall or ceiling. Adapting the eyes from light to darkness several hundred times a day is fatiguing.

If the surrounding area has a brightness at least one-third that of the task, visual conditions are reasonably good. Surroundings should not be brighter than the work zone.

Glare can be reduced by higher illumination levels throughout the workplace and by finishing surfaces in colors with high light reflectance. Light colors on ceilings, walls, floors and machines reflect a high percentage of light and reduce contrast between adjacent surfaces.

Some directional and shadow effects are often desirable in general lighting. They help to accentuate the depth and form of solid objects but harsh contrasts should be avoided. Clearly defined shadows, not too deep, are helpful in some operations, such as textile inspection.

Recommended levels of light for various operations will be found in many reference books. One of the most comprehensive works on lighting is the *IES Lighting Handbook*. Much useful information is also contained in manuals published by manufacturers of lamps and fixtures.

Existing levels are determined from readings with a light meter at the spot where light is needed. This device gives a direct reading of the number of footcandles.

**General lighting.** The minimum amount of light required for an area is termed general lighting. This has been defined as a uniform distribution of the light to produce approximately equivalent seeing conditions throughout an interior.

Localized general lighting sources are usually arranged 10 feet or more above the work. They should prevent too great a contrast in brightness between the more highly lighted work area and the adjacent areas, provide sufficient light for general safety and protection, and enough light for ordinary visual needs.

For general overhead lighting, levels range from 5 footcandles for inactive storage and passageways to 100 footcandles for high-speed production and highly-skilled work.

Where higher levels are needed, supplementary lighting units are usually installed.

To insure adequate levels, even where conditions are favorable, the system should be designed to give initially at least 25 per cent more light than the recommended minimum.

Where dirt collects rapidly and systematic maintenance is not provided, the initial value should be 50 per cent above the minimum.

**Supplementary lighting.** Some difficult seeing tasks require more light than can be obtained economically by overhead general lighting. For such work supplementary fixtures are used.

Two types of equipment meet most needs. One uses small concentrating projectors to increase the light on the work and provide directional quality.

Another type is the large area, low brightness area, such as fluores-

—To page 25

# INDUSTRIAL FLOORS

**FLOORS** must be strong enough structurally to support both static and moving loads. They must also withstand the impact and abrasion of foot and wheel traffic and falling objects.

The floor surface must offer good traction and resistance to slipping under normal use.

For most requirements there is a variety of satisfactory flooring materials. Sometimes a compromise between the best material and the installation cost may be necessary.

## General Requirements

Various operations make special demands on the floor but the following specifications, or a reasonable compromise are desirable:

1. **Strength**—Sufficient to carry four times the expected static load or six times the moving load.

2. **Resistance to slipping**—Not slippery nor likely to become slippery through wear or contact with other materials.

3. **Durability**—Must stand up under normal traffic and wear evenly without developing holes and splinters.

4. **Maintenance**—Easy to keep sanitary and in repair.

5. **Fire resistance**—Important in most industrial property.

6. **Comfort**—Resilience and low heat conductivity.

7. **Quietness**—Another aid to reducing fatigue.

8. **Initial cost**—Often the deciding factor.

## Flooring Materials

Each material has its limitations. Some with a high rating for durability and resistance to slipping may be too expensive for general use. These are often usable for limited special areas where a sure footing or resistance to chemical or abrasive action is important.

The accompanying table will serve as a guide in selecting flooring. It does not include all types of flooring or all problems concerning their use. Manufacturers have devoted much research to these problems and have considerable data available.

Smooth, hard surfaces, like concrete, are susceptible to chipping and abrasion. Trucks with steel wheels and heavy falling objects are destructive to the surface. Rubber tires are easier on floors as well as on the ears.

Concrete is suitable for a wide variety of industrial uses, interior and exterior. It is one of the best materials for damp locations, but does not withstand acids. The floor should be graded to avoid spots where liquids can collect.

Drains with strainers are needed where the surface is cleaned by flushing or where there is danger of flooding.

A durable roughened surface, resistant to cracking and dusting, can be obtained by a wood float finish to a mixture of pea gravel, sand and cement. Too smooth a surface is slippery when wet and is actually more tiring to the feet than a rougher one.

Hardening compounds or sealers can be applied to prevent dusting.

Concrete floors can be made conductive and non-sparking with surfacing compounds containing non-ferrous metallic aggregate. This treatment also makes the floor more wear resistant.

For repairing holes and cracks some compounds are superior to concrete. Patching with concrete, even when well done, may crack out under heavy loads.

For painting, a general purpose floor enamel may be used but finishes prepared especially for concrete are more durable. New concrete should be treated with zinc sulphate solution to neutralize alkalinity.

Concrete provides a rigid and substantial base for resilient types of flooring.

Resilient non-slip mats are an aid to comfort where men must stand in one position for long periods. Men who move about in their work are less likely to complain about floors

COMMON FLOORING MATERIALS FOR INDUSTRIAL USES

AREA	Concrete	Asphalt hot mastic	Asphalt emulsion	Wood block	Wood plank	Asphalt tile*	Greaseproof asphalt tile	Resin binder mastic	Linoleum*	Terrazzo	Rubber tile	Ceramic tile*	Plastic tile	Metal plates	Grating
Floors on grade .....	X		X	X	X	X							X		
Floors below grade .....	X					X	X								
Suspended floors .....			X		X	X	X	X	X	X	X	X			X
Driveways .....	X	X	X												
Ramps and loading docks ..	X		X	X	X										
Manufacturing areas .....	X		X	X				X							
Warehouses .....	X		X	X											
Stair treads .....	X					X			X	X			X	X	X
Offices .....						X			X		X		X		
Laboratories .....						X	X		X	X	X		X		
Cafeterias .....							X		X				X		
Washrooms .....	X					X				X	X	X	X		
Food processing .....	X						X					X			
Corridors .....	X								X	X			X		
Platforms, catwalks .....					X									X	X

\* Also available in conductive grades for explosion-hazardous areas



being cold or hard. Footwear also has a bearing on comfort.

**Asphalt** (hot mastic) is non-dusting, elastic, odorless, and easily repaired. Problems of application restrict its use indoors.

Asphalt is resistant to weather and moisture but is affected by oils, solvents, acids and alkalis. It stands up well under traffic but ordinary grades soften at temperatures above 95 degrees F.

Harder grades of asphalt remain firm up to 158 degrees F. There are also acid-resisting grades.

**Asphalt emulsion**, sold under various trade names, is made into a mortar with sand and cement and laid cold about one-half inch thick. It is used extensively for patching. On a substantial wood base it will carry moderate traffic; with a concrete base it will take heavy trucking. The surface is somewhat harder than the hot mastic type. Both types are affected by oils and solvents.

**Mastic flooring** of other types usually has a resin binder. The materials are generally resistant to oils, solvents and alkalis, but the manufacturer should be consulted about the exposure. These materials are relatively high in price and are used principally for patching and for resurfacing limited areas.

**Ceramic tile** is frequently used where oils, acids or alkalis are present and in food product plants where floors must be washed frequently.

**Asphalt tile** is suitable for offices, stores, light manufacturing areas, and floors below grade. Several grades are available: industrial, standard, greaseproof, conductive, and greaseproof-conductive. It is moisture resistant but susceptible to indentation. It is lower in price than most types of flooring. It is non-slippery in its normal state and can be kept in good condition with non-slip floor finishes. Solvent waxes should not be used.

**Linoleum** is quiet and comfortable underfoot. It is used in office, laboratories and workrooms, where cleanliness is important. Heavy gauge linoleum will withstand loads up to 75 pounds per square inch without permanent marking. Since highly polished linoleum is extremely slippery, the choice of a finish is important.

**Rubber** is resilient and has high dielectric strength which is undesirable where static electricity is a problem. Conductive types of rub-



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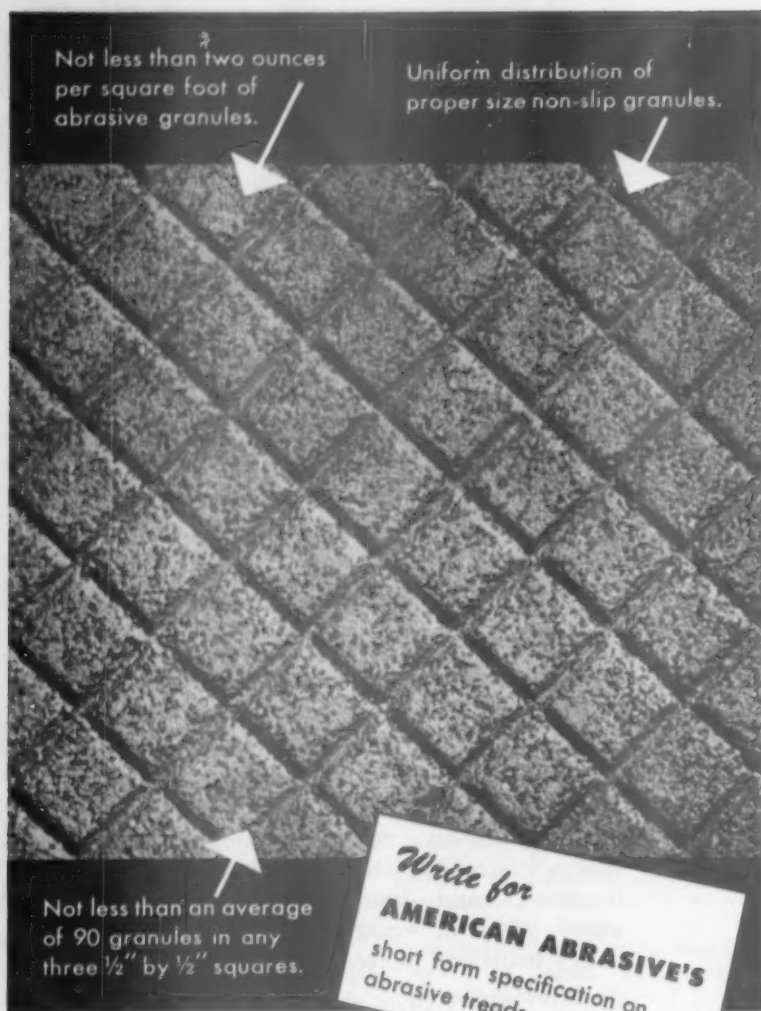
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### Floors

—From page 21

ber flooring are suitable for such locations. Abrasive rubber flooring is useful for stair treads, elevator sills, thresholds.

**Vinyl plastic**, usually in tile form, is durable and decorative but higher in price than most materials. It resists acids, alkalis and most organic solvents. The surface is nonporous and easy to keep clean.

**Wood block** is used for heavy duty general purpose floors. A floor of this type is durable, relatively noiseless and comfortable under foot and does not become slippery. Blocks laid on a smooth, rigid base will stand up under heavy trucking and are not likely to crack. Blocks should be impregnated with creosote for resistance to dampness.

Blocks should be set in high melting point pitch. Ordinary pitch or tar filler may stick to wheels and shoes in hot weather.

**Wood plank.** Hard, close-grained wood provides a floor that is comfortable and reasonably durable under foot traffic. Under moist conditions, boards have a tendency to swell and buckle. A heavy sub floor makes the surface flooring more resistant to moisture and traffic. Under heavy wheel traffic, boards may loosen or break frequently, causing hazardous conditions and excessive maintenance. A penetrating floor seal protects the surface and makes cleaning easier.

**Fabric surfacing.** Heavy fabric coated with mineral grains is used indoors and out for stair treads, ramps and around machines. The material can be applied to concrete, metal or wood. It is backed with adhesive which adheres to the surface under pressure. It wears well and is resistant to water, oil and weather.

**Steel plates** are serviceable for platforms, stair treads, floors, hatchways. They wear well and are easily cleaned but are highly conductive of heat and are noisy.

Plates with checkered extruded patterns offer good traction and resistance to slipping. When worn, plates can be roughened with a welding torch.

Steel plates are also used over ducts which carry electric circuits or pipe lines. They are easily assembled and can be removed for servicing equipment underneath.

National Safety News, March, 1955

**Magnesite** is suitable for light traffic. It must be laid on a rigid base. It should not be used where there is excessive moisture or hydrostatic pressure, as in basements. It is resistant to oil. A coating of bituminous paint is necessary to protect metal surfaces in contact with magnesite since it corrodes some metals.

**Terrazzo** floors are durable and easily maintained. The mixture can include abrasive aggregates to provide a non-slip surface. Sealers make it impervious to most acids. Where there is excessive foot traffic, as in building lobbies, rubber mats reduce slipping hazards and protect the surface.

**Lead** is used for floors exposed to acids and as insets or mats for secure footing in operation of woodworking machines or other places where the results of a slip and fall would be unusually serious. Lead is conductive of heat, nonsparking and quiet.

**Zinc** is non-sparking and sometimes used in such locations as compounding rooms where fire and explosion hazards exist. Zinc is attacked more readily by acids and alkali.

**Cork tile** is quiet and resilient and has high anti-slip and insulating ratings. In dry locations it stands up well under light traffic. It is expensive for most industrial uses but it will reduce damage to dropped tools and materials.

**Abrasive metal plates** are used for thresholds, elevator sills, stair treads and other locations where appearance and a durable, non-slip surface are essential. Plates with abrasive particles incorporated in the surface are available in both steel and non-ferrous metals.

**Conductive floors** of several types are important in the control of static electricity where explosives are manufactured or where flammable gases, dusts and vapors may form explosive mixtures. Conductive floors ground static electricity and stray currents.

**Gratings and grille floors** are often used for platforms, catwalks, stair treads, fire escapes, and over floor openings. They offer a sure footing and are practically selfcleaning.

Gratings in numerous designs are made in steel. Where light weight is essential, aluminum grating is available.

## STAIRS AND RAMPS

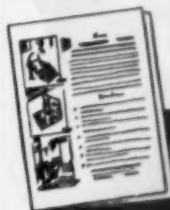
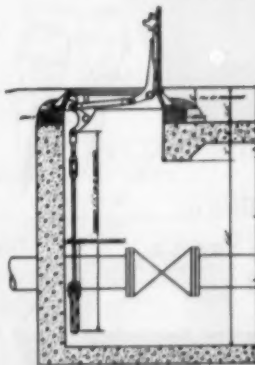
**STAIRS AND RAMPS** carry a heavy volume of traffic in plants where operations are conducted on more than one level. Three types of permanent passageways between levels are: (1) Stairs (2) Ramps or inclines (3) Fixed ladders.

The following general limitations apply:

Stairs are used where the grade is between 20 and 50 degrees from the horizontal. Preferred angle is 30 to 35 degrees.

Ramps and inclines should slope as little as possible: 15 degrees is the recommended maximum.

Fixed ladders are for grades over  
—Turn page

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## Stairs and Ramps

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50 degrees where stairways are not practicable.

### Stairs

Long stair flights should be avoided. Landings every tenth or twelfth tread are recommended.

For grades between 7 and 20 degrees, a combination of stairs and level landings may be used.

**Treads and risers.** Ratio between depth of stair treads and height of risers determines the angle or pitch of the stairs, which should be between 30 and 38 degrees from the horizontal. Tread depth and riser height must be constant for each flight.

Winders should be avoided. Wedge-shape treads make it more difficult to ascend or descend safely.

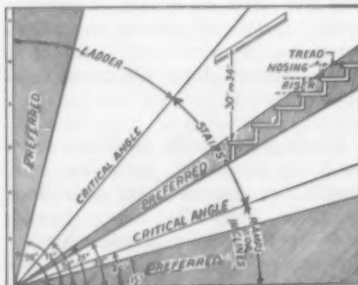
**Treads** must be deep enough that, in descending the stairs, the ball of the foot does not project beyond the nosing and the heel does not strike against the riser above.

**Building Exits Code, A9.1**, specifies that treads of new stairs shall not be less than 9½ inches, exclusive of nosing. The Code also states that no stairs with a tread of less than 6 inches, exclusive of nosing, shall be permitted.

Stairs subjected to severe use, as in public buildings, should have treads with a durable non-slip surface. Materials used for original installation or repairs include abrasive metal, steel with extruded patterns, grating, plastic compounds, rubber and fabric with abrasive surface.

**Risers** should not be more than 8 inches nor less than 5 inches in height. Greater or less height will cause one to take an unnatural stride which may result in a serious fall.

**Railings and handrails.** ASA Code Floor and Wall Openings, Railings



Preferred angles for ladders, stairs and ramps.



and Toe Boards, A-12, requires that every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as specified.

#### Ramps

Ramps facilitate wheeled traffic between levels and for foot traffic are preferable to stairways when it is practicable to use them. They should be built to the least slope possible. Maximum recommended slope is 15 degrees. A rise of more than 1 foot in 10 is prohibited in industrial plants in some states.

For wood ramps materials used in construction should meet the requirements for scaffolds. Width should be adequate for traffic and open sides should be protected with standard railings 42 inches high.

Toe boards should be installed where the ramp extends over a work place or passageway. Cleats 16 inches apart are needed on steep inclines.

Planks should not overlap. The length of the plank should run the long way of the ramp. Ramps used for wheelbarrows should have an odd number of planks with no cleats on the center plank. Width should be not less than 3 feet.

Concrete ramps are recommended for heavy traffic. Anti-slip surface is obtained by rough floating or incorporated in the finish coat. Hardeners and troweling should be avoided.

When the concrete surface has been worn smooth, it can be roughened by scrubbing with dilute nitric or muriatic acid. The surface is then hosed to remove all traces of acid.

Ramps used by heavy vehicles, such as power trucks and heavy-duty hand trucks, should have solid curbs as well as handrails.

Ramps included as part of aisles or traffic routes should be as wide as the aisle to avoid bottlenecks.

Splinters, nails, irregularities and breaks in the surface should be repaired immediately. Cracked or pitted concrete can be resurfaced with one of the numerous flooring compounds on the market.

Outdoor ramps and platforms should be kept clear of snow and ice in winter. If ice cannot be removed immediately, sand or cinders may be applied to give traction. In cold climates radiant heating installed in the concrete is often a good investment.

Fixed ladders should have parallel sides of wood or metal, and should be permanently fastened at top, bottom and intermediate locations. If 20 feet or longer, the ladder

should be provided with cage or basket guard.

Fixed ladders over 30 feet long should be built in zigzag sections, unless cages are used, and should be provided with safety platforms at intervals of not more than 20 feet. Rungs should be omitted above the working or landing platform. Side rails should be carried 3½ feet higher and preferably goose-necked. Openings more than 18 inches between the ladder and the working platform should be protected by a landing platform.

#### Light

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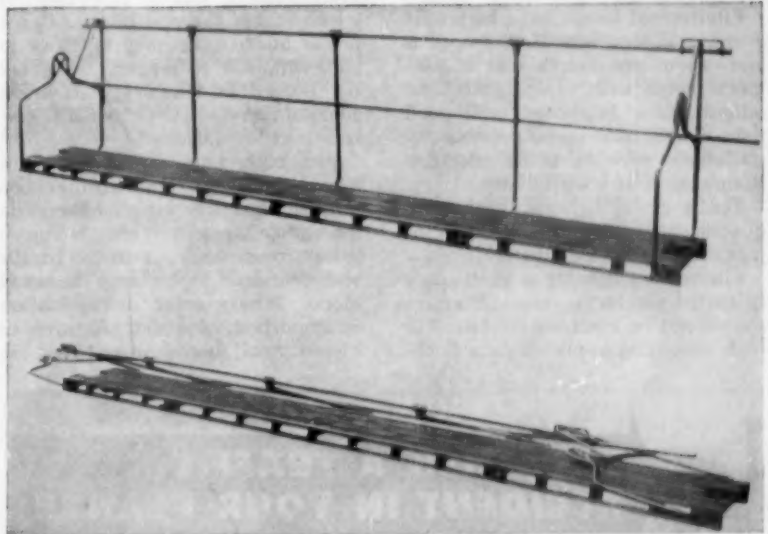
cent desk or bench lamp. It can provide either general lighting for a small area or extra light for critical work, such as inspection.

Supplementary lamps should be shielded, louvered or mounted to prevent glare.

#### Artificial Light Sources

Three common sources are: (1) Filament lamps; (2) Fluorescent

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## Light

—From page 25

lamps; (3) Mercury vapor lamps.

**Filament (incandescent)** lamps are available up to 1500 watts for general and special service. There is a type for almost every industrial, public and domestic need. For many purposes low first cost and convenience may offset the higher efficiency of other light sources. No auxiliary equipment is needed; merely a standard socket and available current.

Quality of light is pleasing and most colors look well under it.

**Fluorescent lamps** have high efficiency and long life. Heat output is low—about one-fourth that of filament lamps with comparable light output. Low brightness and good light distribution make possible installations which provide adequate illumination of good quality.

For a given lighting level more fluorescent units are needed than for incandescent or mercury systems.

Fluorescent lighting is particularly suited for large areas. Fixtures should not be mounted too low. For high mounting applications a fluor-

escent system is sometimes more economical than either mercury or incandescent lamps.

In spite of low surface brightness, bare fluorescent lamps are too bright for eye comfort. Louvres or translucent panels improve diffusion and reduce glare.

**Mercury vapor discharge lamps** are highly efficient light producers, with high output per watt, long life and low operating and maintenance costs. Small size and high intensity make it possible to obtain high lighting levels with a relatively small number of units.

Mercury lamps are available in a wide range of sizes and wattages. They require auxiliary equipment which makes the cost high. After a power interruption they take five to eight minutes to restart. To avoid the hazard of temporary darkness combination mercury-filament system may be installed.

For high bay mounting where areas are large and maintenance difficult, mercury lamps offer definite advantages.

For rough work, as in steel mills and foundries, they may be used alone. Where color discrimination is important, alternate fixtures of mercury and incandescent lamps are

used. A new color-improved type gives the same effect as when equal wattages of mercury and filament lamps are combined.

**Reflectors.** Lamps used without reflectors waste light and may cause excessive glare. Many types adapted to the light source and location are available. Factors to be considered in choosing the unit are:

1. Distribution of light and suitability for the interior.
2. Efficiency of light output.
3. Sturdiness of construction.
4. Adaptability if more light is desired.
5. Economy of cleaning and replacement.

Lamps with reflectors built into the bulb are advantageous where dust, fumes and other conditions make maintenance difficult or costly. The internal reflecting surface is protected against depreciation and light is diffused through the bottom of the bulb. Reflectorized lamps are available in both filament and mercury vapor types.

### Natural Light

A plant may be designed to make full use of natural light or to depend largely or wholly on artificial light. Light of satisfactory quality and quantity can be obtained from either source. The problem is primarily one of economics. Construction which takes full advantage of daylight may be expensive.

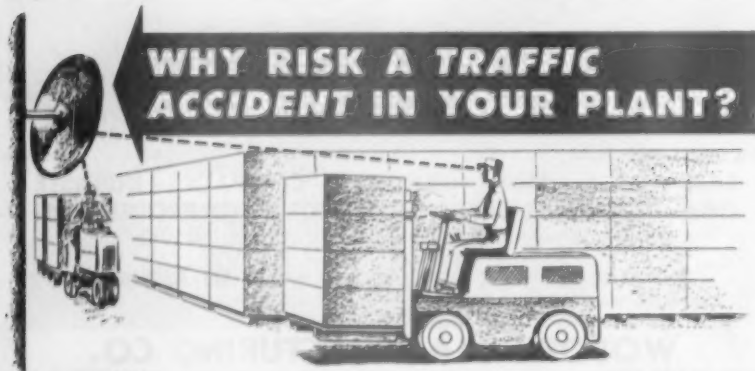
Side windows alone are inadequate for lighting extensive areas, even in bright daylight. Sawtooth, monitor or skylight windows take full advantage of natural light but add to the cost of construction and maintenance.

**Refracting or diffusing glass** is helpful in subduing glare. It alters the direction of light and improves its distribution, particularly to distant parts of the room.

**Translucent coatings** for windows on the sunny side of buildings are also helpful in reducing glare.

Reflection of daylight from sources outside a building can often be utilized. Light colors for faces of structures, walls of courts, and sawtooth roofs are helpful. These surfaces should be kept clean and free from sources of glare.

Sudden transition from bright to dim areas in a plant is hazardous. While the pupil of the eye is adjusting itself to the dimmer light there is a period of semi-blindness. Gradations of light at the approaches to areas of different intensity will avoid this trouble.



**Klear-Vu Safety Mirrors** are the answer to the dangerous blind corner problem in your plant or warehouse. They are also adaptable for outdoor use in your parking lot, loading deck area or other points where traffic converges.

Mounted at cross aisle intersections, entrances and exits at a height of 8 to 10 feet, Klear-Vu Safety Mirrors clearly reflect oncoming intersection traffic to both power truck operators and pedestrians.

Style	No.	Dimensions
Circular convex	120	12" diam.
Circular convex	180	18" diam.
Circular convex	240	24" diam.
Flat rectangular	918	9" x 18"
Flat rectangular	1640	16" x 24"

Available in either convex or flat glass styles, the mirrors are easily installed and quickly adjustable to any desired angle.

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### Special Lamps and Fixtures

Where lighting equipment is required for special uses or subjected to abnormal conditions, many types of lamps and fixtures are available.

**Glow lamps** are used as signal, pilot and night lights. They are not practical for general illumination.

**Shock-resisting lamps** give greater service where ordinary lamps would have a short life because of excessive vibration.

**Weather-resistant lamps** are used for outdoor lighting in industrial plants, docks, athletic arenas, etc. They stand exposure to rain, sleet and snow without cracking.

**Explosion-resistant fixtures** are used where dusts, gases, fumes and vapors may create a hazardous atmosphere.

**Infrared lamps**, available in types and sizes up to 1000 watts, are used for baking, drying and heating processes, as well as for therapeutic use.

### Maintenance

Efficient lighting requires a systematic maintenance program. Equipment may meet all require-

ments when installed but dust and grime immediately start reducing light output.

The first step in a maintenance schedule is to check illumination periodically with a light meter. When light has decreased to 75 per cent of its original value, the lamps and reflectors should be washed with warm water and a detergent containing no free alkali.

**Group replacement** of lamps, both filament and fluorescent, is often practicable and desirable. The saving in cost of replacing a large number of lamps at one time is greater than the value of the remaining light output of the lamps. Point of replacement is usually 60 to 80 per cent of the rated lamp life.

**Disconnecting hangers** permit lowering fixtures to the ground or floor for cleaning, relamping and repairs. Much climbing is eliminated.

### Emergency Lighting

Where failure of the power system might endanger life, an emergency lighting system is desirable. In some states it is required under certain conditions.

Searchlights, stationary or port-

able, which can be concentrated on critical areas, are often desirable for outdoor use.

Portable systems, mounted on trucks, can be moved to the scene of a fire or accident to aid fire-fighting and rescue work.

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Light, Color and Accidents—H. L. Logan, Oct. 1952.

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##### American Standards Assn.

Marking Physical Hazards and Identification of Certain Equipment, Safety Color Code for—Z53.1-1953.

Identification of Piping Systems, Scheme for—A13-1947.

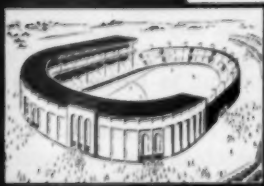


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Quickly and Easily Installed  
by Anyone — No  
Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
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- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket, enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

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## Stop slips on floors by coating with **FLINTDEK**\*

CROWDS ARE SAFER WALKING through grandstands, stadia, auditoriums, and other areas ... when the ramps, aisles, steps and washrooms have been coated with anti-slip Flintdek.

You can trowel it on ... or spray for most economical application. And dress up the floors at the same time ... with five attractive colors to choose from.

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# HOUSEKEEPING and MAINTENANCE

**W**ITHOUT good housekeeping and systematic maintenance of buildings and equipment, even the best-designed plant can develop an alarming list of accident and health hazards.

Without attention to housekeeping, employees will trip over loose objects on floors and stair. They will slip on oily and wet floors and be hit by falling objects. They will tear their hands and puncture their feet on projecting nails. Fire hazards will develop.

Good housekeeping is indicated by: Floors free from grease and oil slick; clearly marked aisles; adequate lighting; no excessive material or waste in the work area; and neat and orderly equipment and machinery. Such conditions are evidence of good management. With them a low injury rate may be expected.

Housekeeping requires organization and supervision. It also needs a staff trained in cleaning methods and the necessary cleaning equipment and supplies.

Not the least of the aids to cleanliness and appearance, and certainly to the morale of any organization, is paint. It not only brightens the work area and conserves light but it also serves as stimulant to better housekeeping by making dirt and disorder conspicuous.

Building maintenance and repair involve much work off the ground. Safety for clean up and maintenance crews requires the use of sound ladders, selected for the requirements of the job and kept in safe condition. For work at greater heights there are various types of scaffolds.

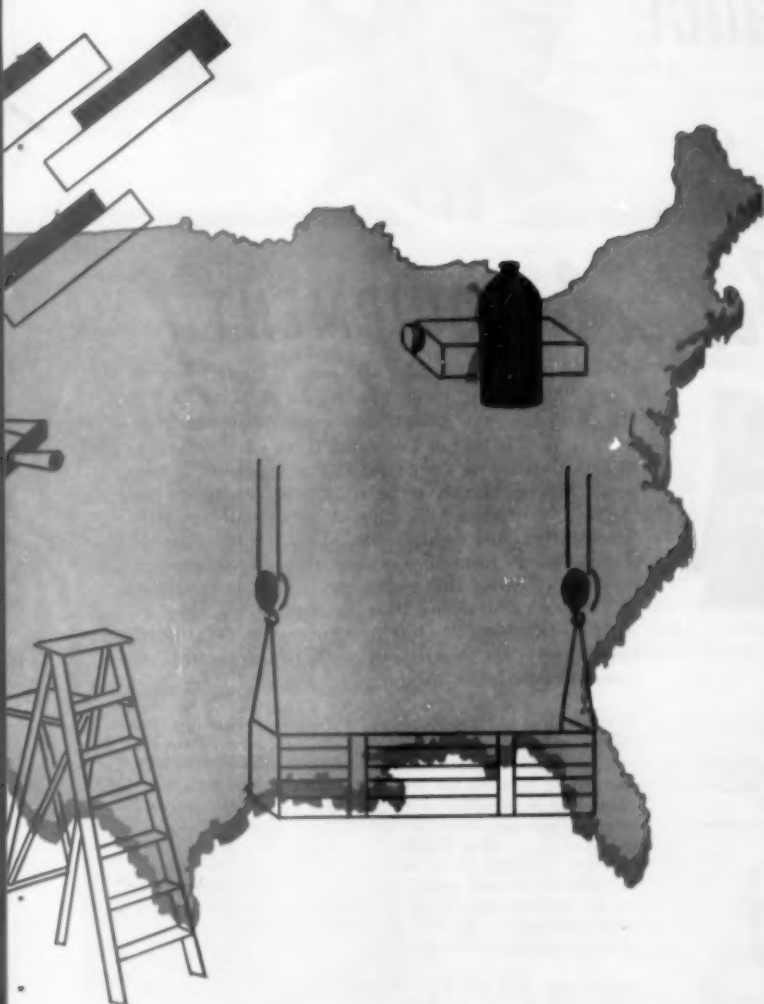
And housekeeping takes in the whole plant, indoors and out.





## HOUSEKEEPING and MAINTENANCE

2



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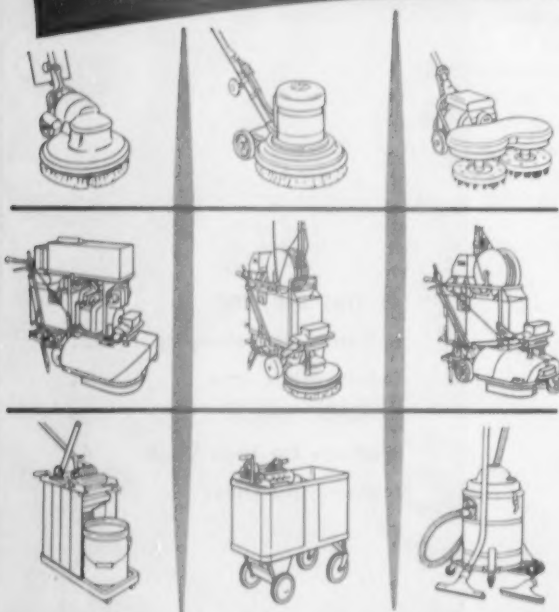
Planning the Office . . . . . 56

# Keep your floor-maintenance men happy...



## with *Job-Fitted* EQUIPMENT!

Choose from the **COMPLETE** *Finnell Line*  
More than a score of models and sizes  
permits selection of the equipment  
that's exactly right for your job!



However much a maintenance man may want to do a good job, and at the same time show savings in labor costs, he's stymied if the machine is too small, or too large, or is otherwise unsuited to the job. Different floors and areas call for different care and equipment. That's why Finnell makes more than a score of floor-maintenance machines. From this complete line, it is possible to choose equipment that is correct in size as well as model... that provides the maximum brush coverage consistent with the area and arrangement of the floors.

Finnell makes *Conventional Polishing-Scrubbing Machines* in both concentrated and divided-weight types, each in a full range of sizes... a *Dry-Scrubber*, with self-sharpening brushes, for cleaning grease-caked floors... *Combination Scrubber-Vac Machines* for small, vast, and intermediate operations, including gasoline as well as electric models... *Mop Trucks*... *Vacuum Cleaners* for wet and dry pick-up, including a model with By-Pass Motor. In addition, Finnell makes a full line of fast-acting *Cleaners* for machine-scrubbing... *Sealers and Waxes* of every requisite type... *Steel-Wool Pads*, and other accessories — everything for floor care!

In keeping with the Finnell policy of rendering an individualized service, Finnell maintains a nation-wide staff of floor specialists and engineers. There's a Finnell man near you to help solve your particular floor-maintenance problems... to train your operators in the proper use of Finnell Job-Fitted Equipment and Supplies... and to make periodic check-ups. For consultation, demonstration, or literature, phone or write nearest Finnell Branch or Finnell System, Inc., 2203 East St., Elkhart, Ind. Branch Offices in all principal cities of the United States and Canada.

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IN ALL  
PRINCIPAL  
CITIES

# INDUSTRIAL HOUSEKEEPING

**HOUSEKEEPING** affects every phase of industrial operation. Its activities cover the entire premises—indoors and out. Its benefits often are felt throughout the community.

Improved appearance, with its effect on employee morale, are noticeable results but the effects go much deeper. Productive efficiency, health, and more effective control of accident and fire hazards are also achieved by cleanliness and order.

Housekeeping is the combined responsibility of management, supervision and employees. Maintaining interest requires constant stimulation through supervision and the printed word.

## The Plant

A well-designed, well-built plant is easier to keep clean, orderly and free from hazards. Some essentials are:

1. Aisles of ample width, clearly marked.
2. Ample room to work.
3. Adequate and convenient storage for materials and tools.
4. Materials-handling equipment and methods that avoid congestion.
5. Ventilation to remove air contaminants—at the source where possible.
6. Floors and walls that require a minimum of maintenance.
7. Good lighting—well distributed artificial light; effective use of available daylight.



Heavy-duty portable vacuum cleaner removes dust, dirt and scattered raw material from hard-to-reach places, protecting both workers and machines. (U. S. Hoffman Machinery Corp.)

8. Personal service facilities—clean, up-to-date washrooms, lockers, and an inviting place where employees may eat lunch.

**Organization.** Maintaining orderly and hygienic working conditions requires an adequate crew of able-bodied men. They should be trained in their duties and provided with the necessary equipment and supplies.

## Cleaning Equipment

**Vacuum cleaners.** Heavy duty types are available in several models and capacities. Their usefulness is increased by a variety of attachments. In addition to floor cleaning, they are useful for removing dust from corners and from places overhead.

Where dust sources are close together and a large volume of dust must be removed, a piped system may be practical. Cleaning implements are attached to inlets located at frequent intervals. Some hotels and office buildings use this type of dust removal.

For most industrial uses, portable vacuum cleaners are more satisfactory. In most operations, the dust sources are widely scattered and portable equipment meets all requirements.

**Floor machines** of several types handle heavy jobs of floor cleaning efficiently. With them, floors can be scrubbed or dry-cleaned, waxed and polished. Like vacuum cleaners, floor machines can be obtained with a variety of attachments.

Crusts of dirt, oil and metal cuttings can be removed with revolving wire brushes much more quickly and thoroughly than by hand spudding.

For finer finishing, steel wool rolls can be used. A vacuum pick-up for collecting dust is essential for dry operations. Suction in connection with a scrubber damp-dries the floor quickly. Scrubbing, rinsing and drying can be done with a minimum of interruption to production.

Floor machines may be purchased or rented. Some manufacturers have service men who will train plant maintenance crews in cleaning methods.

**Power sweepers** are time and labor savers where large areas must be swept and the litter is relatively light. Some models are also used for

sweeping up leaves and litter from the plant grounds and driveways.

**Brooms, brushes, mops, etc.,** are needed in all plants to supplement mechanized equipment. Tools of good quality are more durable and efficient and they encourage better work.

For dry sweeping, a wide cotton mop or a hair broom may be used. Oily mops may leave a dust-catching film.

**Magnetic sweepers** pick up ferrous chips, filings, nails and tacks from factory floors, drives and walks, where such material might cause fire, explosion or personal injury. This type has a rotary non-electric magnet which is removed from the unit for clearing it of accumulated metal.

A larger power-driven model is used outdoors where large areas must be swept. These will remove nuts, bolts and other ferrous objects around hangars and on runways where they might be sucked into jet engines.

**Aisle marking.** Wide clear aisles are signs of a well-kept plant. White lines are constant reminders to keep them free from obstruction and to pile stock within designated areas.

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Self-propelled floor machine which applies the cleanser, scrubs, rinses and damp-dries floor in one operation. (Finnell System)

# COLOR'S MANY USES

**COLOR** applied scientifically to the work area and equipment, chiefly through the medium of paint, makes these important contributions to efficient operation and better working conditions:

1. Conservation of light
2. Improved visibility
3. Pleasant and restful surroundings
4. Better housekeeping
5. Identification of fire and accident prevention equipment and hazards
6. Instructional and warning signs

**Psychology of color.** Certain colors are known to arouse definite mental and emotional responses. Familiar colors and the usual reactions to them are:

1. Yellow—Cheering and stimulating.
2. Blue—Cool; desirable where temperatures are high.
3. Green—Restful to the eyes. Blue-green gives a sensation of coolness. Yellow-green has more warmth.
4. Red—Danger, excitement.
5. Orange—A bright, warm color which should be used with discretion.
6. Violet and purple—Rich colors implying luxury.

## Background Colors

Color schemes which conserve light yet provide more cheerful and attractive interiors than the old plan of mill white for ceilings and upper walls and "practical" colors for dados and machines have been developed by paint companies.

Sharp contrasts in bright and dark areas cause eyestrain because of the continual adjustment of the eye.

White is widely used for ceilings because it reflects more light—80 to 88 per cent. For rooms with low ceilings, or where people frequently look up at them, as in hospital rooms, cream, ivory or sky blue is preferable to dead white.

Colors of high reflectance are also suitable for overhead networks of girders, pipes and other equipment.

Soft tints, such as light gray, pale green and light blue, are suitable for sections of walls in the range of vision. Soft gray, for example, is restful and does not show dust.

A dado the height of work benches and machines, or about one-third the height of the wall, makes stains, soil and marks less conspicuous. It may be a deeper tone of the color used on the upper wall but should not be too dark.

**Floors** should have a reflectance value of 25 per cent or more. For

machines, desks, and benches, 25 to 40 per cent is suggested.

## Point of Operation

To make it easier to see the work and to avoid injury, paint is used to spotlight the point of operation. The body of the machine is painted in one color and the working areas in a lighter tint.

Four shades of gray, ranging from light to dark, are standard colors for machines. Critical parts should stand out in cream, light tan, or other light contrasting colors.

**Light sources and color.** Type of light source should be considered in selection of colors. Incandescent lamps tend to reduce strength and intensity of color because of a slight yellowing effect of the light.

Fluorescent light is of three types—white, daylight and soft white. Daylight units give a bluish hue and can be used with blue, green and blue-violet. White and soft white units produce a warm light suitable for ivory, cream, beige, rose and tan.

## Color for Identification

Safety codes for the use of standard colors for identification of equipment and hazards have been developed by the American Standards Association. *Safety Color Code* for

**Marking Physical Hazards and the Identification of Certain Equipment** Z53.1—1953 specifies uniform colors for marking physical hazards, for indicating the location of safety equipment, and for identifying fire and other protective equipment.

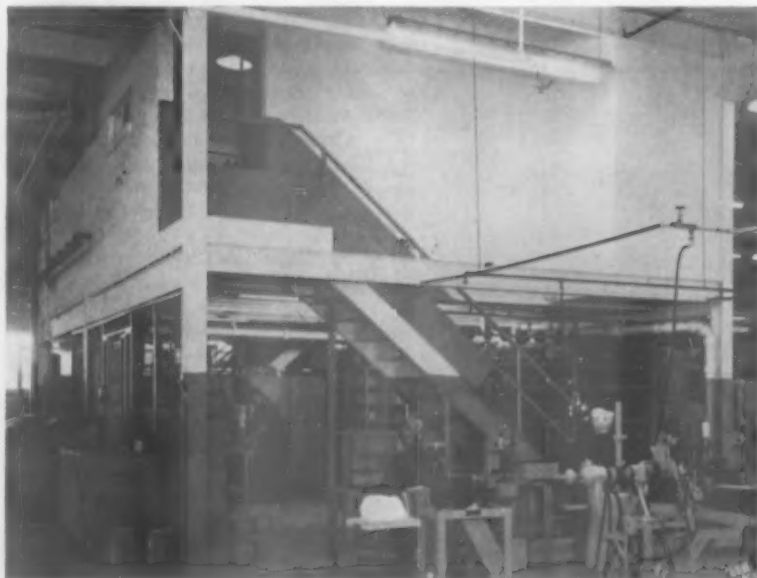
**Red** is recommended for identification of fire protection equipment, and for walls or supports on which extinguishers are mounted; flammable liquid containers (except shipping containers) on which the name of the contents should be stenciled; lights at barricades and danger signs; emergency stops on machines such as rubber mills, wire blocks and flat work ironers; and emergency stop buttons for electrical switches.

**Yellow** has high visibility and is recommended for marking hazards that may result in slipping, falling, and bumping into objects. Solid yellow and stripes and checks of yellow and black, may be used to attract special attention. Top and bottom treads of stairways, low beams and pipes and crane hooks are places where yellow may be used.

Black and yellow stripes are often used on mobile equipment, such as tractors and industrial locomotives.

**Green** in combinations with white, such as a green cross on a white background, is used to designate the location of first-aid and safety

—To page 35



Employee restrooms occupy space above toolroom at DeVilbiss (Canada) Limited's new plant. Flat roof carries a three-inch pool of water for economical evaporative cooling in summer. Light plus paint provide a bright, cheerful atmosphere. (The Austin Company Limited)





## Pittsburgh COLOR DYNAMICS®

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Ultra-Accurate Workmanship  
in Graflex Plants**

**By reducing eye fatigue,  
properly engineered colors  
aid operators to make  
world-famous camera equipment  
with less re-work and scrap!**



**Let Us Make an Engineered  
Color Study of Your Plant—FREE!**

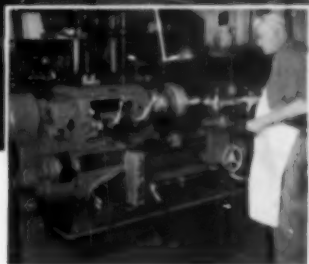
• Why not investigate what COLOR DYNAMICS will do in your plant? Send for our free book which explains this painting system and how to use it. Better still, call your nearest Pittsburgh Plate Glass Company branch and ask to have a representative give you a comprehensive engineered color study of your plant—without cost or obligation. Or mail coupon at right!

**PITTSBURGH'S PAINTING SYSTEM** of COLOR DYNAMICS, purposefully used on walls and machines in the plants of Graflex, Inc., of Rochester, N. Y., improves the efficiency, safety and morale of the operators who make the world's best-known high-speed cameras.

Photographic equipment made by this pioneer maker is known to press and cameramen for its versatility and reliability. Industry and military use its identification and microfilming cameras. Telephone companies use its meter-recording cameras. To the Armed Services, Graflex is a leading source of combat and aerial cameras, artillery telescopes and fire-control devices.

The many ways in which operators in the Graflex plants benefit by the use of COLOR DYNAMICS are best summarized in this comment of M. B. Moore, vice president and factory manager:

"Because of the precision our production requires, it is important that our operators have the best possible seeing conditions. By painting walls and ceilings in eye-



rest colors and by using colors on machinery that differentiate working from stationary parts, according to COLOR DYNAMICS, we have relieved eye strain and reduced physical fatigue. An appreciable part of the reduction in re-work and scrap can be attributed to this improvement of our operators' environment.

"Safety, too, has been improved. Our recent record of 411 working days without a lost-time accident gained for us an Award of Merit from the National Safety Council. This improvement in productive efficiency and safety has enhanced morale, creating friendlier relationship and greater cooperation among the members of our organization."

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PITTSBURGH PLATE GLASS COMPANY

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## "¡Valiente!" cried the Spanish admiral

He cheered as his launch fished this man and seven more waterlogged American sailors out of Santiago Harbor, Cuba, on the morning of June 4, 1898. This was straining Spanish chivalry to the break-



ing point, for Richmond Hobson (right) and his little suicide crew had spent the previous night taking a ship into the harbor entrance under a hail of cannonade and deliberately sinking her

to bottle up the Spanish fleet.

Hobson, who planned and supervised every detail of the operation, from placing the scuttling charges to dropping anchor under fire, was actually an engineer, not a line officer.

In Santiago Harbor, he led his first and only action against the enemy. But his cool-headed daring made him as much a hero of the day as Admiral Dewey. And proved again that America's most valuable product is Americans.

These Americans—proudly confident of their nation's future—are the people who stand behind United States Series E Savings Bonds. They are the people who, by their spirit and abilities, make these Bonds one of the world's finest investments.

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**For your own security—and your country's, too—  
invest in U.S. Savings Bonds!**



## Color

—From page 32

equipment. Location of stretchers, gas masks, and bulletin boards is identified by this color.

Black and white, in stripes or checks, are used for housekeeping and traffic markings.

Orange has high attention value. It is designated as the basic color for designating dangerous parts of machines or energized equipment. It emphasizes such hazards when enclosure doors are open, or when gear, belt or other guards around moving equipment are open or removed, exposing unguarded hazards.

Blue is for warnings, such as painted barriers, flags, etc. These should be located conspicuously at the starting point or power source of machinery.

Purple is the basic color for designating radiation hazards.

Yellow should be used with purple for markers such as tags, labels, signs and floor markers.

### Piping Systems

Use of the basic colors of red, yellow and green in a simplified plan

for piping systems is recommended in ASA Code A 13, 1928 (R1947) *Scheme for the Identification of Piping Systems*. Orange and blue are also used by some companies although these colors have not yet received official approval.

Contents of pipes are classified as follows:

Red.....Fire protection  
Orange or  
Yellow.....Dangerous  
Green.....Safe  
Blue.....Protection materials

Color may be applied the entire length of the pipe or in bands 8 to 10 inches wide near valves, pumps, and at repeated intervals along the line. The name of the specific material is stenciled in black at readily visible locations at valves, pumps, and similar places.

Color stripes painted at the edges of the color bands may also be used to identify the exact contents of lines, but this is less satisfactory than stenciled identifications. Labels for marking piping, which conform in color and size of letter to the code, are on the market.

Acids and alkalis cause some paints to change color. Paints exposed to moisture and chemical action should be carefully selected.

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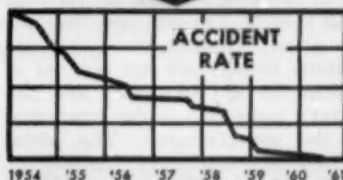
TO STOP THIS



PREVENT THIS



DO THIS  
ECONOMICALLY



SEND FOR SAMPLE and  
PRICES OF THIS



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**AIR-OPERATED CLEANER!**



The Bennett cleaner is safe... because it is completely non-electrical. There is no danger from sparking, because there are no moving parts.

The Bennett cleaner saves time and money! It's light and highly portable. Cleans walls, shelves, beams, storage bins and other out-of-the-way surfaces with a minimum of labor!

Powerful action developed by compressed air (approximately 90 lb. pressure) — adequate for all industrial applications. Highly efficient WET or DRY pickup.

Adaptable to any industrial application! Picks up metal chips, glass particles, etc. Incoming bag with hose permits removal of liquids from any normal surface or tank.

**NO MOVING PARTS!**  
Unlimited life...  
no danger from sparking

**COMPACT — POWERFUL!**  
Highly efficient WET or DRY pick-up

**LIGHT — PORTABLE!**  
Body of minimum weight

**EASY TO OPERATE!**  
Designed to reduce operator fatigue.  
Hand-operated, no moving parts.

Special fittings and brushes make the new Bennett cleaner adaptable to any industrial application. Interchanging long with hose makes it adaptable for removal of liquids from any normal surface or tank.

**NO ELECTRICAL CONNECTIONS NECESSARY!**

**COMPLETE UNIT WITH 5' ALUMINUM HOSE, AND BAG \$29.95**

**M-M-A, Inc., Lancaster, Pa.**

# PORTABLE LADDERS

**FEW ITEMS** of equipment are more useful in factory, warehouse and store than a ladder. There are many occasions when it is necessary to get from one level to another and safety may depend on a good ladder.

Where frequent access to any location is needed, stairways, ramps and fixed ladders are desirable. For occasional access to different points a portable ladder is a necessity.

Whenever a ladder is involved in an accident, defective construction is seldom the cause. Sometimes the ladder is too light for industrial demands or otherwise unsuited to the job. Even well-built ladders become unsafe through neglect and abuse. Unsafe practices and physical disability of the user are frequent accident causes.

**Standards.** In selecting ladders, a reliable guide is the American Standard Safety Code for Portable Wood Ladders, A14.1-1952. Ladders built according to code specifications are plainly labeled.

Metal ladders are not covered at present by an ASA code and the buyer's protection is the reputation of the manufacturer. The Metal Ladder Manufacturers Association, organized in 1949, has established its own standards. Ladders of mag-

nesium and aluminum built according to these specifications meet exacting tests.

## Definitions

Following are types of ladders commonly used in industry as defined in the American Standard Safety Code:

**1. Step Ladder.** A self-supporting portable ladder, non-adjustable in length, having flat steps and a hinged back. Its size is designated by the over-all length of the ladder measured along the front edge of the side rails.

**2. Single Ladder.** A non-self-supporting portable ladder, non-adjustable in length, consisting of but one section. Its size is designated by the over-all length of the side rail.

**3. Extension Ladder.** A non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

**4. Sectional Ladder.** A non-self-supporting portable ladder, non-adjustable in length, consisting of two or more sections so constructed that the sections may be combined to function as a single ladder. Its size is designated by the over-all length of the assembled sections.

**5. Trestle Ladder.** A self-supporting portable ladder, non-adjustable in length, consisting of two sections hinged at the top to form equal angles with the base. Size is designated by the length of the side rails measured along the front edge.

**6. Extension Trestle Ladder.** A self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder, with suitable means for locking the ladders together. Size is designated by length of trestle ladder base.

**7. Special-Purpose Ladder.** A portable ladder which represents either a modification or a combination of design or construction features in one of the general purpose types of ladders previously defined, in order to adapt the ladder to special or specific uses.

**8. Trolley Ladder.** A semi-fixed ladder non-adjustable in length, supported by attachments to an overhead track, the plane of the ladder being at right angles to the plane of motion.

**9. Side-Rolling Ladder.** A semi-fixed ladder, non-adjustable in length, supported by attachments to a guide rail, which is generally fastened to shelving, the plane of the ladder being also in its plane of motion.

## Materials and Construction

**Wood,** which meets the requirements of weight and strength at moderate cost, is the most widely used material. Acceptable kinds and grades of wood are listed in the ASA Code.

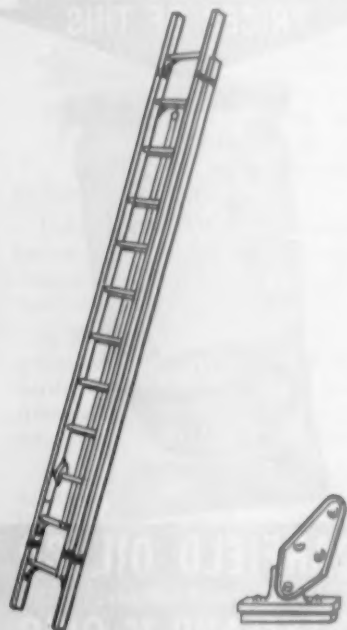
Ladders may have either spreading or parallel straight lines. They may have sides flaring at the base to increase stability, and converging at the top for specific uses.

**Light Metals.** Alloys of aluminum and magnesium alloys are light in weight and resistant to moisture. In case of overload there is deflection warning instead of sudden breakage. Prices are higher than for wooden ladders.

Metal ladders should be examined for sharp edges and burrs on the side rails and for soft metal rivets that might shear off under load.

Metal ladders are conductors of electricity and should not be used around electrical equipment. Decals

—To page 38



Extension ladders should have automatic locks, guide irons, pulley and rope for raising and lowering, and ladder shoes.



The platform (safety) ladder provides a secure working platform for maintenance jobs.





**U**p here, a slip means curtains. Yet accidents are rare because the steeple-jack is provided with first rate safety equipment.

**THIS IS A  
CALCULATED  
RISK**



**THIS IS AN  
UNNECESSARY  
RISK**

**D**own here, the consequences may be less tragic—but the percentage of accidents is very much higher. And the costs are enormous.

### THE SAFETY DEVICE IS IN THE POLISH

You can't saddle personnel with safety belts, but you can remove slip-hazards by maintaining your floors with LEGSURE, the polish that gleams *without* slipperiness. Administrators of leading hospitals, industrial plants and commercial buildings report slip-accident reductions of 98% and *more* since turning to LEGSURE.

Best of all, LEGSURE saves you big money on labor and materials. It never needs buffing. And its scuff-resistant finish is so durable that only rarely does it need stripping. Made and distributed by

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☐ Send me a Free copy of your new booklet on Legge Safety Maintenance.

Name

Firm

Street

City  Zone  State



## Ladders

—From page 36

or painted warnings against such use should be carried on all metal ladders.

Single, extension, stepladders, platform ladders, and planks, stages and hangers are available in light metals.

**Step ladders** are available in lengths up to 20 feet. Three types are listed by the Code:

- I—4 to 20 feet, heavy duty
- II—4 to 12 feet, medium duty
- III—3 to 8 feet, light duty

More substantial construction is, of course, specified for the longer, heavier duty ladders.

Stepladders should be constructed so that the front section will have level treads when in the open position.

For some operations the rung-back type of stepladder permits a helper to assist from the back of the ladder.

Each stepladder should be equipped with a spreader or locking device of sufficient size and strength to hold the front and back sections securely in the open position.

A bucket shelf is useful for many maintenance jobs. It should support a load of 25 pounds and be fastened so that it can be folded up when the ladder is closed.

**Platform (safety) ladders** are a development of the stepladder. They provide a solid working platform guarded on three sides. They are particularly useful on jobs at fixed heights where the work requires considerable freedom for the worker.

Safety ladders are usually built for heavier duty than the ordinary stepladder.

Height to platform ranges from 3 to 18 feet, over-all height being two feet more.

**Single ladders** up to the maximum length of 30 feet specified by the Code are available. For sizes larger than 24 feet, extension ladders are preferred for convenience in storage and transportation.

Sectional size of side rails varies with the length of the ladder and diameter of rungs increases with the width of the ladder between side rails.

Diameter of rungs should be not less than 1½ inches. Holes for rungs may extend through the side rails



or be bored to give at least 13/16 of bearing to the rung tenon.

**Oilers' ladders** should be provided with hooks at the top so the ladder may be securely fastened to overhead shafting.

**Extension ladders.** Two-section extension ladders up to 60 feet in length are recognized by the Code. Specifications for dimensions of side

—To page 40

**ALL THE SAFETY OF A STAIR**

# NOW...

for  
work levels  
up to  
**15**  
feet  
high



Ballymore all-welded-steel Safety-Step Ladders available from one to twelve steps. Over 100 models to choose from. Portable—they roll. Up to 9 steps, they automatically lock to floor when you step on—9 steps and over, they have step-on brake casters at front. Send for catalog. The Ballymore Company, Wayne 17, Pa.



## Safety-Step LADDERS



## Wind-Kor

**Assures ABSOLUTE SAFETY  
plus Freedom of Movement  
for men on HIGH jobs**



Light, compact unit mounts overhead, independent of scaffold, platform or swing stage. Includes Automatic Re-wind to keep line taut. Allows free movement, but positively prevents accidental falls. Lowers insurance rates. Furnished with 5/16 nylon rope (1950g tensile strength) or 5/32 stainless steel cable (2500g test).

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SAFETY DEVICE CO.**  
3960 Elston Avenue - Chicago 18  
COrnelia 7-4010



PAINTING, washing windows, building repairs and general maintenance are safely speeded with this lightweight, mobile "Fold-A-Way"® Aluminum Scaffold at a New Jersey Turnpike Building. These Scaffolds are easily erected in a few minutes time, without acrobatics. Wheels and swivels are easily locked. Underwriter's Laboratories approved. (\* Trademark)

## How to Keep Costs Down On Overhead Work

WHEN MAINTENANCE goes above floor-level the increased risks can be costly—in lives as well as dollars!—unless you provide efficient platforms that place men where they can work quickly, easily and safely.

Avoid trouble—use this safety check-list to match your equipment to each off-the-floor job: 1. Is work within ladder range? 2. Is there a wall for support or bracing? 3. Is area below work suitable for giving support? 4. Is frequent shifting of equipment necessary? 5. Must people and machines be under work area? 6. Will the scaffold or ladder carry the load?

You can keep overhead job costs and risks under control with Patent Scaffolding Co. Ladders and Scaffolds. PS can supply you with the right equipment for any off-the-ground work, because PS has the only complete line. That's why it pays to remember—when it comes to scaffolding, come to PS. Write for free bulletin G-205.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

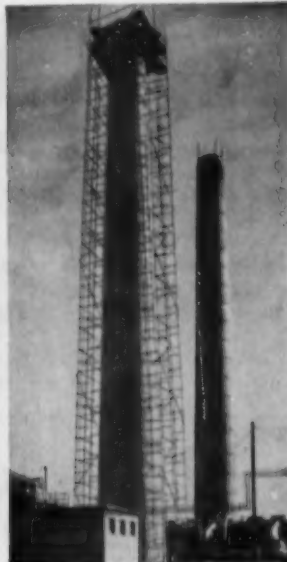


THE **PATENT** SCAFFOLDING CO., INC.

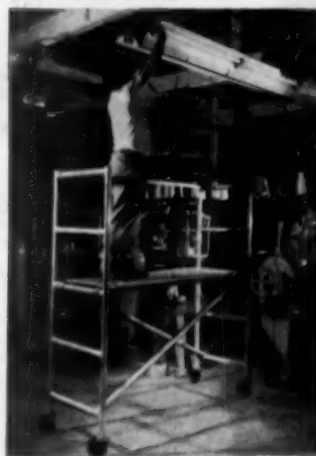
38-21 12th Street Dept. MSN Long Island City 1, N. Y.  
West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.  
Branches in all principal cities



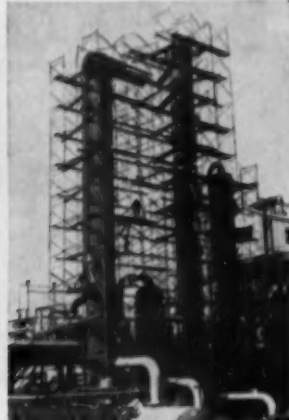
MACHINE REPAIR and other beyond-arm-reach maintenance is safely handled with a "Gold Medal" Platform Step-ladder. Workman stands on a firm, steady platform. Approved by Underwriters' Laboratories.



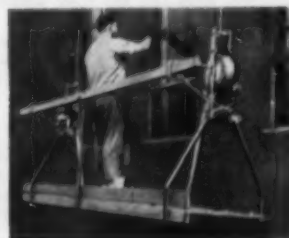
FIRE-SAFE TUBELOX® Steel Scaffolding has practically no size or height limitation—is widely used for construction and repairs. Easily erected on uneven terrain, it conforms to any contour.



REPLACING FLUORESCENT lamps is a safe, fast job with Aluminum Ladder Scaffold. Ladder Frames come in 29 in. and 4 ft. 6 in. widths with 6, 8, and 10 ft. spans. Base Section is 6 ft. high. Other heights by adding 4 ft. and 5 ft. 4 in. units. 29 in. width is ideal for use in limited-space areas.



"TROUBLE SAVER"® Sectional Scaffolding provides safe platforms for men working at Koppers Co. refinery, Port Acres, Texas. It is erected from pre-fabricated 5-ft frames. Approved by UL.



"GOLD MEDAL"® Junior Scaffolds are ideal for outside painting, washing windows and general medium-duty work. Available in steel or aluminum. 100 to 200 ft. of cable. Raised by ratchet lever. Approved by Underwriters' Laboratories.

To help you solve any scaffolding problem, PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

## Ladders

—From page 38

rails and type of wood permitted vary with the length of the ladder.

Minimum overlap for ladders up to and including 36 feet is 3 feet; from 37 to 48 feet, 4 feet; from 49 to 60 feet, 5 feet.

Smaller side rails on rung-type ladders are acceptable when reinforced by steel wire running the length of the side rails and securely fastened to them.

Locks must be positive in action. Guide irons must be securely at-

tached to the ladder and so placed as to prevent the upper section from tipping or falling out while raising, lowering, or in use.

Rope and pulley for raising and lowering, while not mandatory, are desirable.

Trestle ladders of the "A" type (with a center section which slides up and down) are used in maintenance work. These ladders are commonly used in pairs with a stage between them or in sets of four with two stages and with planks from stage to stage.

Points to be considered in selecting extension trestles are guides of adequate length, strong locks of the sliding section, and a safety spreader.

Telescoping ladders are mounted on rubber tired ball-bearing wheels with floor locks. Maximum height of working platform is 15 feet. When down, it will go through an ordinary door or into an elevator.

Telescoping towers reach still greater heights. These portable units can be extended up to 49 feet. The man on the platform controls the travel through an electric push-button system. Another push-button control is located on the frame below but the man above can lock the platform in place by pressing a safety button. Outriggers give stability.

Chain and rope ladders are designed for emergency use as a means of escape in case of fire or explosion, and for rescue work where rigid ladders cannot be used. These are not a substitute for permanent fire escapes.

Crow's nest ladders. For many outdoor maintenance jobs the "crow's nest" ladder mounted on a truck is used. It is an extension platform ladder, securely mounted on the vehicle, which can be rotated in a complete circle and elevated at various angles from 45 to 72 degrees from the vertical.

This device permits working over parked vehicles and is used for such jobs as tree trimming, servicing street lights, police and fire alarm signals, inspecting overhead lines, connecting house services, and general emergency work. It can be lowered into compact form for traveling.

## Accessories

Ladder shoes. Whenever a portable ladder is used on anything but dry ground, there is always danger of the feet slipping. To overcome this hazard, several types of ladder shoes have been devised. In general, they grip the surface, either by sharp points or by friction.

One type of sharp point is the metal spike; another is the abrasive shoe. The friction type includes those shoes which depend upon frictional resistance for the gripping qualities, such as cork, lead, and rubber or neoprene with interwoven cord.

Another type made of cotton asbestos material and interwoven wire

—To page 44



# FLOORMOBILE

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your plant  
cleaner and

# Safer!

reduce fire and explosion hazards  
promote safety  
reduce absenteeism  
save time and money

Floormobile cleaning has been proved the only practical and economical way to clean dust and dirt from large floor areas. Cleaning with brooms or other mechanical means doesn't get the dust; *in fact*, these methods *raise* dust, causing it to settle on machinery, motors, wires, fixtures and work in process. And, too, dust carries germs which cause sickness, absenteeism and added costs.

You can do your cleaning faster, easier and better . . . and control dust . . . with Floormobile. Floormobile is a mobile unit with a powerful suction nozzle that will pick up dust, dirt, trash, string, excelsior, wood and metal scraps, paper and other materials . . . some impossible to pick up with other methods. Floormobile cleans 20,000 square feet an hour (7 times faster than hand sweeping and 14 times faster than a vacuum cleaner with a floor wand and hose).

Since its introduction 1½ years ago, Floormobile has had general acceptance and is being used by many leading companies including DuPont, Mueller's Macaroni, Ford, Goodyear, GE, Marshall Field, Monsanto Chemical, GM, Caterpillar, Pillsbury Mills, Norton and Kaiser Steel.

*A clean plant is a safe plant . . . and Floormobile will help you keep it clean, quickly and economically. Send for descriptive folder and full details today.*

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# SCAFFOLDS for high work

**FOR CONSTRUCTION** jobs and for extensive maintenance work, scaffolds are indispensable. Types of scaffold suitable for many specialized operations have been developed, in addition to the built-up wood scaffolds.

Every scaffold and its supporting members should be designed to support a given load with a factor of safety of at least 4.

Principal causes of accidents involving scaffolds include defective materials, faulty construction, unsafe work practices, and physical disabilities of the individual.

Some men are affected by high levels, and those employed for such work should be selected carefully.

## Types of Scaffolds

Many types of scaffolds, for general use and for special trades, have been devised. Principal types are:

1. Tubular steel
2. Portable
3. Swinging
4. Suspended
5. Built-up wood

**Tubular steel scaffolding** is used on large construction jobs where it will be in use for considerable time and where work is carried on at great heights. This type of scaffolding may be purchased or rented. When rented, the contract usually includes erection and dismantling.

Steel scaffolds have low wind resistance and only the wood planks are combustible. Dismantling is less

hazardous than tearing down wood scaffolding. Interchangeable parts facilitate erection and dismantling.

All steel members should be rust-proofed by cleaning and repainting after each job.

Tubular steel scaffolds for use inside buildings are frequently mounted on casters. When casters are included, the base section should be made rigid by additional bracing to tie the bottoms of the upright tightly together. Caster locks should be provided to prevent movement while in use.

**Portable scaffolds.** Maintenance work in industrial plants and in public buildings is made quicker and safer by portable metal work stands and towers. They provide a broader platform than the platform ladder, permitting more than one man to work and providing more space for tools.

Some types of portable towers are telescoping; others have fixed heights. In addition to the models with four casters, there are work stands of the wheelbarrow type easily moved by one man.

**Swinging scaffolds** are useful for painting, tuck-pointing, window glazing and washing, and other operations where the scaffold height must be adjusted frequently as the work progresses.

A swinging scaffold should be securely hung from eaves, cornices, or other reliable support, with hooks of adequate strength. Anchorage should be carefully inspected before the hooks are placed.

Ropes should be of the best grade manila not less than  $\frac{3}{4}$  inch, on at least six-inch blocks. Steel cable should be not less than  $\frac{5}{16}$  inch. Steel cable is wound on a drum, not pulled by hand.

**Suspended scaffolds** are supported by outrigger I-beams attached to the frame of the building. They are recommended for use on buildings more than five stories high which have a frame to provide the overhead support. The scaffold is raised and lowered by steel cable operated by a winch.

The shackles or beam clamps holding the cables should be securely fastened to the outriggers with a stop bolt in the outer end of each outrigger. Cables should be securely fastened to the outriggers and to



This one-man safety cage is an improvement on the bosun's chair for such jobs as painting and repairing walls, tanks and stacks. (Patent Scaffolding Company)

the putlogs which carry the platform or to the hoisting machines.

**Built-up scaffolds.** Wooden scaffolds are temporary structures built on the job. Attempted economies in materials and workmanship frequently result in scaffold failures accompanied by serious injuries, if not by fatalities.

Lumber for scaffolding should be inspected on delivery and stored where it will be protected from weather.

Specifying a particular grade of lumber may not be practicable since no one grade will be available in all localities. Names also have different meanings in different sections.

Spruce, fir, longleaf yellow pine, Oregon pine; or wood of equal strength should be used. Material should be straight grained, free from knots, checks, cracks, decay or other defects.

Only the strongest species and grades should be used. In general, the heavier and denser woods are strongest.

Species and grades of lumber recommended for scaffold planks include:

1. Douglas Fir — select structural plank.
2. Southern Pine — merchantable structural longleaf plank and dense structural square edge and sound plank.

—Turn page



Suspended scaffold supported by outriggers used in repairing parapet nine stories above ground. Sandbags provided the counterbalance for hanging part of scaffold. (Waco Manufacturing Co.)

# ALCO-LITE aluminum ladders are *Safer-Longer!*

## A QUARTER CENTURY OF USE

25 years ago the first aluminum ladder was bought by the New Kensington, Pa. Fire Department. After 13 years of fire fighting and 12 years of general duty, without a single repair, this ALCO-LITE Aluminum Ladder is still in excellent condition.

## 1 because they're aluminum

ALCO-LITE Ladders are made of lightweight, high tensile strength aluminum alloy. They are approximately twice as light and strong as similar ladders made of wood. You will find them easier to lift—easier to carry—easier to use. They will never rust, rot, splinter, spark or burn. ALCO-LITE Aluminum Ladders require almost no maintenance.

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This nameplate is your assurance of having an aluminum ladder that will withstand the hardest industrial use. Exclusive ALCO-LITE design and construction make it perform better—safer—longer. Every ladder more than meets the rigid code and tests of the ASA and Metal Ladders Association.

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Dries and cleans floors—Absorbs water, oil and grease—Eliminates scrubbing. Prevents slipping accidents.

Dri-Rite quality absorbents have been proven in use by large and small industrial plants and are available to you.

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100 W. Chicago Ave., Chicago 10, Ill.

## Get DRI-RITE Protection

## Scaffolds

—From page 41

3. Larch—structural plank.
4. Norway Pine—select common.
5. Eastern Spruce—select common.
6. Tamarack—select structural plank.

The structural grades of lumber should be used for scaffold planking wherever possible. Where these are not available, each individual plank should be carefully inspected.

No planks of less than 2-inch nominal thickness (1½ inch dressed) or less than 8-inch nominal width (7½ inches dressed) should be used.

Specifications for construction of various scaffolds will be found in *Accident Prevention Manual for Industrial Operations*, and *Safety Code for Building Construction A10.2-1944*.

**Railings and toeboards.** Most codes require railings on scaffolds more than 12 feet high but railings are desirable on lower scaffolds. A top rail should be 36 to 42 inches above the floor with an intermediate rail half way between the top rail and the walkway surface.

Toeboards are needed to prevent tools or materials from falling.

**Overhead protection,** consisting of planking heavy enough to stop any falling object, should be provided for scaffolds when men are working overhead. This protection should be not more than 9 feet above the working platform.

**Sidewalk bridges.** Where construction or repair work is carried on over sidewalks, protection for pedestrian traffic is needed. Sidewalk bridges of adequate strength are provided by the companies furnishing sectional steel scaffolding.

**Ladder-jack scaffolds** are used chiefly by painters and electricians. They should not be used at a height of more than 22 feet above ground or floor. An unsupported span should be not more than 10 feet.

### New Uses for Nylon

Tarpaulins made of nylon fabric with coatings of neoprene on both sides demonstrate the high value of the combination of these two synthetics by performing better and lasting longer than the usual article. The synthetic tarpaulins are 50 per cent lighter.

Race horses now wear shoes of nylon resin to minimize the weight on their feet.—*Chemical Digest*, Foster D. Snell, Inc.



**STRONG—STURDY—LIGHTWEIGHT**

**Daylons ARE SAFER**

The accepted standard for ladders, Dayten's are built of selected, tested kiln dried Sitka Spruce, Douglas Fir, or West Coast Hemlock. Designed in accordance with the latest specifications of the "American Standards Association Safety Code," and to meet Underwriters Laboratories Standards for Ladders.

**APPROVED AND LABELED BY UNDERWRITERS LABORATORIES**

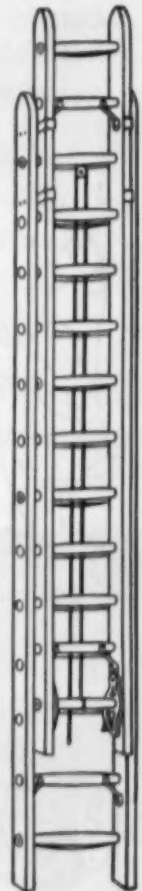


DAYTON Fig. 200 is a well constructed step ladder built for heavy industrial use to stand maximum abuse. Can be supplied with fully rodded back for extremely heavy duty jobs. Bucket rack optional. All hardware zinc plated. Sizes 4' to 16'.



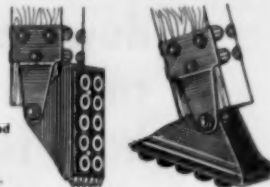
DAYTON Type A is constructed of tested airplane spruce, reinforced with rigid steel supports for great strength, lightness of weight. Handrails of steel guard large roomy platform for added safety. These famous ladders can be set up instantly, are easy to carry and fold compactly for storing. Automatic locking feature insures safety while ladder is in use. Standard rubber safety shoes no extra cost. Sizes 3' to 12' to platform.

DAYTON Fig. 102, a strong ladder for general industrial use. 1-5/16" x 2 3/4" side rails (available 1 1/2" x 3 3/4" side rails if desired—DAYTON Fig. 100). Three truss rods and four dowel braces per section for extra safety. Available with spring locks, rope and pulley if desired. All hardware is zinc plated. Sizes 16' to 40'.



DAYTON Type H, an extremely rugged type ladder, designed and built to meet the demand for a platform ladder with mill wright (rung) type back construction. Tool shelf on top. Ladder shoes standard equipment. Folds absolutely flat for easy storage. Features include pinch-proof type spreaders—corrosion resistant zinc hardware—slip proof treads. Sizes 4' to 16' to platform.

Rubber tread or spiked toe for double use.



DAYTON Safety Ladder Shoes . . . Special suction rubber tread (also in neoprene) really grips. Instantly converted for indoor or outdoor use. Base: 16-gauge steel. Side plates: 13-gauge steel. Renewable treads. Lock nuts, spring washers assure proper adjustment. Zinc plate finish.

For Free Literature, Write Dept. D.

**Dayton**

**safety ladder co.**

2339 Gilbert Ave., Cincinnati, Ohio

In Canada—SAFETY SUPPLY CO., TORONTO

## Ladders

—From page 40

combines the two principles. Suction cups are used in still another type.

Ladder shoes become less effective through wear, especially when exposed to oil and grease on the floor. Consequently, they should be inspected regularly.

**Stabilizers.** When a ladder is used on an uneven surface hydraulic stabilizers attached to the feet keep a ladder firm and steady. These can

be attached to any straight or extension ladder.

### Maintenance

**Inspection.** Among things to look for are: Loose rungs or steps; screws, bolts and other metal parts broken or missing; cracked, or broken up-rights, braces, steps or rungs; slivers; worn or damaged shoes.

Defective ladders should be marked and taken out of service until defects have been corrected. If beyond repair they should be destroyed promptly.

Records of the conditions of all ladders should be kept.

**Storage.** Ladders should not be stored where they will be exposed to weather, nor near radiators, stoves or steam pipes.

### Protective Coatings

Two coats of linseed oil or spar varnish will increase resistance to weathering.

Painting is now permitted by the ASA Code, if ladders are inspected before painting by experienced inspectors acting for the purchaser and ladders are not for resale. Transparent coatings, however, are still preferred by many users.

**Wood preservatives,** which consist of toxic chemicals in non-aqueous solution, prolong the life of wood exposed to weather or in contact with the ground. They offer special protection at the joints or rung holes and tenons. Preservatives of the NSP type (non-swelling, paintable) do not interfere with subsequent painting and varnishing.

### Color

—From page 35

**Paints, enamels and lacquers** provide a medium for the practical application of color. Industrial finishes are often subject to severe exposures and many types of paint have been developed for special needs.

**Floor coatings.** Synthetic enamels and rubber base floor coatings give better service on concrete than ordinary floor enamels and are more resistant to moisture, acids and alkalis.

Light-colored floors conserve light. They may be stippled with darker colors to avoid glaring contrasts.

A painted concrete floor often seems more resilient under foot than one of bare concrete. The thin film of paint may help physically but the psychological effect is probably more important.

—To page 46

*Simpkins suffered from heat fatigue—and his work was extremely poor.*



*Now Morton Impregnated Salt Tablets help Simpkins work fast and sure.*

## You can hold down accidents caused by heat fatigue

Be sure you have plenty of Morton Yellow Impregnated Salt Tablets handy. Their controlled dissolving action gives immediate relief without causing nausea.

Essential body salt lost through perspiring is immediately replaced, but at a gradual rate. Your employees feel better, work better more safely, when they take Morton Yellow Impregnated Salt Tablets.

Morton Yellow Impregnated Salt Tablets come in a handy disposable dispenser. Plastic and heavy-duty aluminum dispensers are also available, as are plain salt tablets.



Complies with Federal Specifications SS-S-31e for Type III, Class C Impregnated Salt Tablets

U. S. Patent No. 2,665,236  
Patented 1954 (Canada) No. 901,314

Place your order this week with your local safety equipment distributor. If he cannot supply you, write.

## MORTON SALT COMPANY

Dept. MS-3, 120 S. LaSalle St., Chicago 3, Ill.

### PAINT REFLECTION VALUES (Per cent)

White	88
Ivory	69
Cream	67
Sky blue	65
Pale green	59
Buff	52
Aluminum	41

Above values are only approximate since colors vary with different paint manufacturers.





## Where people walk, people talk

What are they saying  
about your floors?

Clean, beautifully maintained floors make instant good impressions . . . build good will . . . stimulate favorable comments. Hild Floor, Rug, Carpet and Upholstery Equipment offers you proven results at savings up to 75% over hand-labor costs. Every Hild machine, from the smallest brush to the most powerful vacuum, is precision engineered to give you

unsurpassed results with new economy. Investigate how the Hild System of Maintenance can save you time and money as it has for businesses, industries and institutions all over America. Write today for a free survey of your needs by a trained HFX (Hild Floor Expert).



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25 Models from which to choose. Maintain your Floors at HALF the COST with HILD EQUIPMENT.



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Located on spot where needed. Slot-type release automatically delivers absorbents to floor of dispenser. Easy to dispense with shovel—no waste—saves time—saves money!

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**Oil-Dri** CORPORATION  
OF AMERICA  
520 North Michigan Avenue  
Chicago 11, Illinois

## Color

—From page 44

**Water-thinned paints.** Cold water paints (synthetic resin and rubber base types) are satisfactory for some industrial interiors. They can be applied with spray-coating equipment. They are washable and serviceable where not exposed to weather and dampness.

Rubber base paints are more durable and will stand considerable washing.

**Luminescent materials** (paint, tape and plastics) become luminous in complete darkness after exposure to natural or artificial light.

Fluorescent materials glow only while exposed to ultraviolet light. There is no usable afterglow. These materials are used where it is desirable for the eyes to be adapted to darkness, as in instrument dials, night flying and driving, and where electric power is available for producing light. They enable the operator to observe readings without glare or eye fatigue.

Phosphorescent materials glow after exposure to light and remain luminous after the light is extinguished. They are observed best

under total or near-total darkness. The low intensity of the glow makes them suitable only for close viewing in darkness.

**Reflecting coatings and buttons** are effective where headlights, flashlights, cap lamps and similar sources of light are available.

**Rust prevention.** Paints which form a tight bond with clean metal offer considerable protection against rust and corrosion. When rust has started, ordinary paint is ineffective because corrosion continues under the paint film. Rust-sealing coatings, both clear and pigmented, are often helpful.

## Where Can They Smoke?

Smoking is one of industry's problems, whether it is regarded from the standpoint of the fire hazard or of the time taken from the job for indulgence. But the fact remains that a large percentage of industry's workers have the habit and the way the problem is handled will affect industrial relations as well as safety.

Where flammable or combustible materials are handled, there can be no compromise about smoking at

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**THE TEST**—four sections of flooring, each panel prepared with a different floor wax. All panels subjected to heavy traffic . . .

**THE RESULTS**—The DOLCOWAX panel retained markedly finer lustre—its beauty actually increased with wear—and it retained scuff and scratch resistance to a greater degree.

**DOLCOWAX** premium quality floor wax is most economical in the long run. Ideal for "second coating"—the second coat integrates with the first . . . no "crawling" or "puddling" to prevent an even, uniform film.

**IMPORTANT:** The slip-resistance feature built into DOLCOWAX permits a soft, lovely finish with safety protection! Has Underwriters Laboratories approval, of course.

When preparing floors for waxing, use CINDET, the Dolge all-purpose cleaner, for more complete stripping of old wax film.

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OF YOUR PREMISES  
CONSULT YOUR  
DOLGE SERVICE MAN

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**DOLGE**  
WESTPORT, CONNECTICUT



*"It's like waxing your floors with a film of plastic"*

**W**HEN you apply new SUPER WESTWAX it's just like laying down a protective sheet of tough, transparent plastic on your floors. With NEW SUPER WESTWAX you get

- brilliant gloss
- extra durability
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- easier maintenance

Why? Because this heavy-duty formulation contains — West's crystal clear Plastic Emulsion, MIRITE® and prime #1 yellow Carnauba Wax.

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- dries to a hard, mirror gloss
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- resists water
- requires no polishing

And SUPER WESTWAX is slip resistant — meets Underwriters' Laboratories requirements for floor treatment materials.

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Dept. 7

## Specialists in Industrial Cleaning Products



New York City Transit Authority bus garages use ZORBALL to keep floors safe, dry and slip-proof.

### ZORBALL keeps N.Y.C.T.A. garage floors clean and safe!



The New York City Transit Authority, world's largest transit system, serves millions of people a day.

The bus division alone operates 2,000 buses and 14 garage depots. To keep garage floors clean and safe, the New York City Transit Authority relies on ZORBALL—the all-purpose floor absorbent.

There are good reasons why users prefer ZORBALL over all other absorbents. The N.Y.C.T.A. is sold on its resistance to breakdown, and its safety for employees and equipment. ZORBALL, in the presence of water,

is non-slippery. Almost everyone agrees that ZORBALL is the safest, lowest use-cost floor absorbent available!

**Safest**—ZORBALL will not mud, cake or dust—remains granular, even under heavy traffic or extremely wet conditions. **Lowest use cost**—ZORBALL takes hard use longer, is easily removed, can be re-used.

Your Wyandotte representative or jobber will show how you can save by using economical ZORBALL. Call him today for a sample and demonstration! Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California.



## Wyandotte CHEMICALS

Helpful service representatives in 138 cities in the United States and Canada

Largest manufacturers of specialized cleaning products for business and industry

work. Where no fire or explosion hazard is involved, the matter is one for management, supervision and workers to work out.

If smoking could be prohibited on the premises and the prohibition enforced, it would minimize fire hazards. That, however, would be difficult to accomplish and the result might be surreptitious smoking in out of the way places, perhaps where combustibles are stored.

In many plants smoking areas near the workroom have been provided and reasonable time allowed for relaxation. Supervision is needed for satisfactory operation.

Receptacles for disposal of cigaret and cigar butts and pipe dottle should be placed at the entrance to any department where smoking is not allowed. In some hazardous operations employees are required to leave matches and smoking materials behind when they enter.

Chewing tobacco, while free from fire hazards, is objectionable from the esthetic and hygienic standpoints in some operations, such as the processing of food products. Where permitted, cuspidors should be provided and cleaned frequently. Disposable cuspidors simplify house-keeping.

### Housekeeping

—From page 31

The lines can be renewed quickly, neatly and economically with an aisle-marking machine.

Plastic film tape in white and colors is also used for marking aisles and storage areas. It is said to be durable and resistant to moisture and most chemicals used in industry. Lines can be changed and damaged parts replaced easily.

White has been adopted for highway traffic lines and is preferred for floor marking within the plant.

Trash containers at convenient locations throughout the plant help to keep litter off the floor. Containers with self-closing lids are best, particularly where oily rags and waste are stored. Containers may be painted with a distinctive color to call attention to their presence.

Steam-cleaning units, which deliver jets of steam and cleaning solution under pressure, are used for cleaning some types of processing and fabricating equipment and removing stubborn deposits of dirt from floors, walls, and ceilings.

Both stationary and portable units are available.



# Draw the Line...

on slips and falls in your plant  
... prevent accidents with

**FROST'S  
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**IT'S NEW**

Frost's SURE-FOOT Traffic Yellow is outstanding for plant safety zone marking. Equally effective for eliminating slipping hazards around your plant. It's easy to apply, no special tools or skill is required in applying SURE-FOOT. Millions of carbide crystals give SURE-FOOT its abrasive quality... it dries overnight to a tough, hard, non-skid surface.

Frost's SURE-FOOT is available in 5 eye easing colors... gray, red, black, traffic yellow and green.

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**FROST PAINT AND OIL CORPORATION**

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## SURE-FOOT DISTRIBUTORS

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Standard Ind. Products Co.  
Peoria 5, Illinois  
Universal Safety & Fire  
Equip. Co., Inc.  
Salt Lake City 11, Utah  
V. E. Kennedy-Ingalls Co.  
Milwaukee 14, Wis.

Smoking areas are now provided in most plants. Receptacles which will not tip and spill their contents should be provided for cigaret butts and pipe ashes.

## Supplies

Development of more efficient cleaning materials has kept pace with improvements in mechanical cleaning equipment. Much research has gone into the development of cleaning methods. Manufacturers can furnish helpful data on housekeeping and maintenance problems.

**Detergents.** Basically, water does the cleaning. But water alone is not always effective. It needs the aid of a detergent—soap, an alkali cleaning agent, or one of the newer synthetics. Soap is a detergent, but not all detergents are soaps.

There are three types of dirt: (1) Water soluble matter; (2) Oils and greases; (3) Inert solids.

A cleaner removes dirt by dissolving, emulsifying or suspending it.

Soap is one of the oldest cleaners and a most useful one. When used with hard water soap can be saved by the use of water softeners. Its worst defect is the formation of curds in hard water.

Synthetic detergents are derived from sources other than fats. Petroleum and coal-tar derivatives, and by-products of certain industries provide the raw materials. These cleaners are effective when used with hard water.

Alkalis, such as washing soda, soluble silicates and various phosphates, form the third class of cleaning materials. Compounds of these

—Turn page



Central vacuum cleaning system supplements dust collectors at cork processing machines in keeping plant free from flammable dust. (Lamson Corp.)

REACHING THE HIGH  
SPOTS IS NO PROBLEM  
WITH AN . . .

# Economy

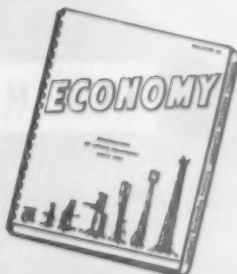
## HI-REACH TELESCOPER

**A man feels safe on an Economy Hi-Reach Telescopier and can work with relaxed attention to the job.**

Stability, strength, and safety has always been our first consideration in engineering these machines. And we've been doing it for 54 years.

If you have a special overhead service requirement or need a material handling machine for a specific job, Economy engineers can build it.

Write for the new Catalog No. 55. Forty pages of pictures and suggestions for special and standard machines. Every plant manager and maintenance superintendent should have this catalog handy for reference.



The Economy Hi-Reach Telescopier shown here has a platform rise of 70 feet above floor level and a minimum lowered height to clear 12 feet. Through either of two push button stations the platform may be raised or lowered to any height. The machine shown is used for servicing lights, unit heaters and other overhead mechanical equipment.

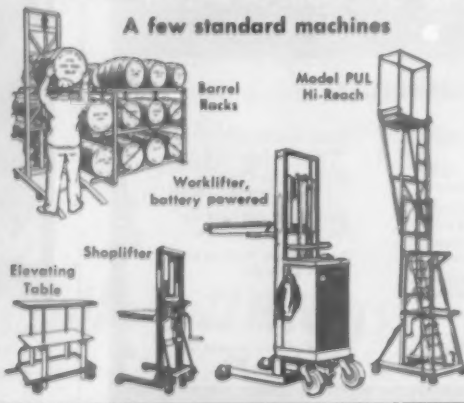
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4505-21 W. Lake St., Chicago 24, Ill.

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**A few standard machines**



## Housekeeping

—From page 49

are marketed under a variety of trade names. They are useful for some types of cleaning where soap is not desirable. When used on floors they do not form a slippery film.

Disinfectants and deodorants are useful, particularly for washrooms and garbage cans. They are not substitutes for detergents.

Odors may indicate either unsanitary conditions or merely a nuisance. They should be removed if possible but a deodorant may be needed at times.

## Care of Floors

Floors of all types have longer life if properly cared for. A protective coating of some type is desirable.

Hardwood flooring in its natural state dries out and cracks and splinters under traffic. Scrubbing raises the grain of the wood and excessive moisture causes it to swell and warp. For protective coatings, sealers, enamels and varnish are used. Sealers penetrate the wood and produce a durable finish.

Concrete, while resistant to moisture, has a tendency to dust under traffic. This can be checked by treating with a sealer. If color is desired, a penetrating dye or a floor enamel may be used.

Linoleum, asphalt tile and rubber tile have an impervious and decorative surface. Care consists of cleaning and preserving this surface. As little water as possible should be used in cleaning.

Wax protects the surface and preserves appearance. It makes regular maintenance easier by keeping dirt on the surface instead of being ground into the floor.

Water emulsion (self-polishing) wax can be used safely on all types of floors. Buffing waxes contain solvents which injure asphalt and rubber. Either type may be used on vinyl plastic floors.

Self-polishing waxes are considerably less slippery than buffing waxes. Tests have been made to determine the frictional resistance of various floor finishes on different types of floors. However, it has not been found possible to give any finish a rating which would apply for all surfaces and all conditions.

For floor scrubbing, the cleaner should do the work without leaving a slippery film. Soap is permissible for such surfaces as concrete, com-

mon brick, wood block and mastic. For marble and smooth tile a cleaning powder that does not leave a slippery residue should be used.

Strong alkalis and coarse abrasives are injurious to many types of floors, and usually milder cleaners will be effective.

Floor coating and finishing materials are listed by Underwriters Laboratories in three classes. Materials listed have been found to have slip-resistance characteristics of not less than 0.5 as determined by the static friction test method of U. L.

#### I. Floor Treatment Materials (FTM):

1. Water-base materials.
2. Fillers, sealers, varnishes, and similar materials.
3. Detergents.
4. Abrasive-grit-bearing liquids.
5. Waxes, other than water base.
6. Sweeping compounds.

(The Gas and Oil Equipment List lists materials according to fire hazard classification.)

#### II. Oil and Grease Absorbents (OGA).

III. Walkway Construction Materials (WCM). Includes floor plates and stair treads made of:

1. Natural
2. Composition
3. Abrasive grit surfaced materials

#### Oil Absorbents


Around machines where oil and grease accumulate, hazardous and unsightly conditions develop. Oil spills should be cleaned up promptly. Non-combustible absorbents make it easier to keep floors clean and reduce slipping and fire hazards.

Absorbents are of two types—one for oils and greases; the other an all-purpose absorbent where water and other liquids are also present. They have a much greater absorbing capacity than sawdust, waste or rags, are non-combustible, and less bulky.

Absorption efficiency of these compounds and their fire safety are rated by Underwriters Laboratories. The compounds are not subject to spontaneous heating unless the absorbed oil has that characteristic.

Oil-soaked garments, shoes, ropes and belts can be dry cleaned by burying in the compound.

Sweeping compounds keep down the dust from dry sweeping. These are listed by Underwriters Laboratories in two groups: Class I, non-combustible; Class II, slow-burning. Tests include combustibility, behavior on heating, and spontaneous heating characteristics.



*You know how to  
operate this extinguisher  
... just by LOOKING at it!*

One glance tells you just how the Randolph operates—no instructions, no explanations necessary. That's why anybody can get a Randolph into action fast! Just point and press your thumb and Randolph's cloud of snowy CO<sub>2</sub> kills fire instantly.

Write for your free copy of the new Randolph Catalog. Carbon Dioxide and Dry Powder, hand and mobile models, hose reel systems, manual and automatic systems.

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AN EXTINGUISHER FOR EVERY TYPE OF HAZARD

**PAINTING**



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# Save 5 Ways Safely...

on Maintenance Work with

## "TROUBLE SAVER" SECTIONAL STEEL SCAFFOLDING

Simplify plant maintenance. "Trouble Saver" Steel Scaffolds assure greater economy and safety.

- Scaffolding erecting and dismantling time is sharply reduced.
- Men do more and better work on firm, safe scaffolding.
- You protect workers against costly accidents.
- Less labor is required for any job.
- Convenient, efficient scaffolding cuts material waste.

"Trouble Saver" Scaffolding is available in types and sizes for every maintenance need — *indoors or outside*. Write for Bulletin PSS-24 and Catalog M.



### "TROUBLE SAVER" Rolling Scaffolds

*Left:* A typical "Trouble Saver" industrial rolling scaffold, equipped with casters, used for repairs and painting.

*Right:* "Trouble Saver" LADDER SCAFFOLDING — can be quickly put together from ladder units, 3', 5', 6'-6" or 10' high. Extension bases, 3', 4' or 5' wide are used for working at greater heights.



**"TROUBLE SAVER"**  
Adjustable  
STEEL TRESTLES



- SAFE
- STRONG
- ECONOMICAL



Details of the quickly adjustable "Trouble Saver" Steel Trestles.

## The Steel Scaffolding Company, Inc.

856 Humboldt Street

Dept. NSN

Brooklyn 22, New York

Telephone: EVergreen 3-5510



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Plan Work Furniture  
For the Individual

**WELL-DESIGNED** work furniture permits efficient work without unnecessary fatigue. Work surfaces should be of correct height. Chairs should be adjusted to the needs of the individual.

Alternate periods of sitting and standing at work reduce fatigue. Since this is not always practicable, furniture should be planned for maximum comfort and efficiency.

**Work benches.** Height of work surfaces, such as benches, machines, tables and assembly lines is determined by whether the workers sit or stand. Another factor is whether hands or eyes are more important to the operation.

Tilted or recessed tables facilitate some types of work.

**Seating.** Height relationship between seat and work is important. Workers differ quite widely in height and proportions and seat height should be adjusted accordingly.

Following are essential qualities for a factory chair:

1. Is it comfortable?
2. Is it safe?
3. Is it easily adjustable?
4. Is it economical to maintain?

A chair should provide back support. Without it the worker uses much energy just sitting erect. The back rest supports the back between the lower ribs and the hips.

A deep form-fitting seat, of the tractor, bucket, or western saddle type, is better than one that is flat or slightly curved. The seat should not touch the tendons and blood vessels on the back of the leg just above the knee.

Too soft a seat is not desirable. Contour is more important than padding.

Edges and corners should be rounded to avoid damage to clothing or injury to persons.

Foot rungs shorter than the foot spread of the chair lessens possibility of tipping, particularly on the higher chairs.

A posture chair must be adjusted to the individual's need or most of its benefits will be lost. The user should also be taught to sit properly.

## Ever Think About Stair Accidents?

Steps, Aisles, Ramps, Working Areas Will Be  
Slip-Proof With These Compounded Rubber  
Step Treads, Runners, Mats . . .

MELFLEX Frictioned Rubber compound for step, aisle and floor covering gives sure-grip SAFETY under all conditions. Resilience with lasting, economical durability reduces noise and assures surface that meets hardest traffic wear.

## Heavy Duty Molded Treads — Grid Pattern or Transit Type . . .

For curved or square nosed steps, molded to fit. Black, diamond grid pattern  $\frac{1}{4}$ " thick. Marbleized colors in blue, brown, green, terra-cotta, gray —  $\frac{1}{8}$ " thick. Riser strips available in same colors. Black transit type treads molded to fit over step edge for extra heavy duty service. Outside or inside installation. These treads applied to any type surface — wood, metal, concrete, stone, tile — with Melastic cement for permanence. No binding strips necessary.

## Mel-Isle Ribbed Runner — Black or in Color . . .

Deep ribbed, self-cleaning surface for extra hard traffic and continuous SAFETY . . . Black up to  $\frac{3}{4}$ " thick and in various widths up to 40". Marbleized colors same as in treads, above,  $\frac{1}{4}$ " or  $\frac{1}{8}$ " thick. We supply all flooring material and treads ready trimmed to your specifications. You have no cutting or waste.

MATS — Neoprene, Vinyl, Frictioned Rubber, Plain Rubber . . . Link mats of all types for every need . . . Neoprene and vinyl links to resist oil, grease, gasoline, acids . . . Frictioned rubber for long service, low cost . . . Multi-colored rubber links for attractive entrance mats.

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Send catalog and price information on SAFETY products.

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SEND THIS COUPON for catalog and prices

## GET FASTER WORK, SAFER PLATFORM with WACO Scaffold Jacks



Waco Scaffold Jacks set up in seconds. Dual purpose head accommodates planks or stringers. Lightweight, folding construction permits quick handling and easy storage. Four adjustable sizes reach all wall and ceiling heights up to 17'6".

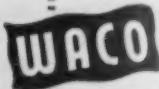
Used by every trade to reach work faster, finish up faster. Write for Bulletin S3-1 for complete information.

Contact your nearest Waco office for ways to save time and money on all scaffolding requirements.

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**YES, THE BIG FEATURE OF CAL-FLOR-DRY IS—  
A LITTLE GOES A LONG WAY.**

CAL-FLOR-DRY absorbs 120% of its own weight in grease, liquids, and oils, including soluble. Maintenance and safety engineers in many industries over the years find Cal-Flor-Dry costs less and does the most thorough job.

Cal-Flor-Dry is habitually used to keep these surfaces dry and safe:

Floors	Decks	Elevator	Grease
Stairs	Benches	Pits	Rocks

Cal-Flor-Dry does not ball-up, nor mush-down when wet. It is non-abrasive, safe on machinery.

Cal-Flor-Dry is habitually used in:

Machine Shops	Service Stations	Railroad
Bulk Oil Plants	Ship-Yards	Repair Shops
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## The FLOR-DRY Company

2318 WYCLIFF STREET  
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## Precautions That Control Lead Hazard

Loss of industrial working time due to lead exposure virtually can be eliminated, Dr. Gilbert B. Meyers, medical supervisor of the Philadelphia plants of the Electric Storage Battery Company, told the seventh annual meeting of the American Academy of Occupational Medicine.

In operation at Exide for only two years, Dr. Meyers said, the present preventive program has been so effective that "we have had to restrict only five out of 1,379 workers from lead exposure jobs. All except one were able to continue working. All quickly recovered clinically."

"Less than three per cent of our workers, who have handled over forty million pounds of lead in two years, require more than the routine checks which Exide's program provides," he said.

Regular urine tests for lead absorption which facilitate early diagnosis, are the backbone of the medical part of the program, according to Dr. Meyers. All workers exposed to lead are tested every four to eight weeks. If hazardous absorption is found, the worker gets a urine test every two to four weeks. If lead absorption approaches the dangerous level, the worker is given blood tests and complete physical examinations at one-to-four-week intervals until his lead level is deemed safe.

Workers with excessive lead absorption are removed from further exposure, Dr. Meyers stated, and "clinical and laboratory studies indicate this usually is all the treatment required for an apparently complete recovery in a matter of weeks."

Exide's program also provides environmental control and worker education. Important features of it are proper ventilation, use of protective clothing and equipment, floor wetting and drainage, adequate sanitary facilities, eating quarters segregated from lead areas, separate lockers for work and street clothing, good plant housekeeping and teaching supervisory personnel and workers how to avoid undue exposure.

## Magnetic Separators Remove Tramp Metal

Tramp iron and steel in conveyor systems may strike sparks which would be dangerous in the presence of combustible fibers, flammable chemicals or explosive dusts. Dangerous particles can be removed by properly installed magnetic separators. Their use also minimizes me-

chanical damage and simplifies maintenance.

Processes which use separators include grinding, cutting or crushing of materials, working of combustible fibers, removal of ferrous particles from food products, and separating ferrous from non-ferrous materials.

Magnetic separators are of two general types—electro magnet and permanent magnet. Selection of the type and form to be used on any process and the installation require expert advice.

### Material Storage

Proper storage of materials, tools, and parts is simply good housekeeping, and good housekeeping is just common sense arrangement of all the items that go into an operation.

There are two main points to remember: Items must be piled and arranged so that, first, they can't fall over to damage themselves or cause accidents; and second, they're readily accessible and can be easily handled. These are both mighty important points to remember.

Pile material so it won't fall down on somebody and store it out of the way of traffic. Pick a storage spot that doesn't create a hazard for plant traffic or require that heavy traffic lanes be crossed to reach it.

For example, don't pile lumber in such a place that you continually have to cross a heavily traveled plant roadway to get to it. Pile it out in the open, with access from all sides, where the boards can be handled easily.

Seven important points are:

1. Give each pile a firm foundation, and start it right.
2. Don't pile material too high for safe lifting and handling.
3. Allow ample room for passageways. Observe clearance rules at aisles, sprinkler heads, and railroad tracks.
4. Never obstruct the path to fire-fighting equipment. Keep fire doors clear.
5. Cross-tie tiers, when possible, so they support each other.
6. When there is danger of the pile being insecure, interlock the tiers with long boards.
7. When piling material in buildings, learn the safe load limit of that particular floor and observe it.

Oils of animal and vegetable origin oxidize readily. Rags, waste, excelsior, and similar materials containing as little as five per cent of some of these oils will ignite spontaneously under favorable conditions.



## NEW 150' WELDREEL

### Welding Hose Reel

Now you can store and handle 150 feet of double welding hose on a Weldreel — with the new Model OAB. The new big reel gives you all the safety and convenience of the 50-foot Model OA and, like the smaller model, is ruggedly built to stand up for years under heavy industrial use.

**ELIMINATES HAZARDS TO SAFETY** — prevents tangles of hose on the floor, cause of many industrial accidents. Permits welder to reel out only as much hose as he needs.

**MAKES HOSE LAST LONGER** — Reduces chances of hose being run over, cut in two or set on fire by a hot electrode. Users of the Weldreel report three to five times greater hose life.

**EASY TO INSTALL ANYWHERE** — Simple mounting permits installation in any position, on floors, walls, ceilings or on mobile equipment. Requires only 11" x 24" space.

**CONVENIENT TO USE** — Keeps hose in a handy location where it may be used alternately by two or more welders. Hose pays out freely and locks automatically at desired length. A slight tug releases lock, allowing the powerful spring to rewind hose onto reel.

See the Weldreel at your supply house or write us direct for descriptive literature



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**TRACK 6**

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## Low Cost Soap DESTROYS GERMS

Germ cost you money . . . through illness and idle machines. Reduce that expense by providing **degerm** Liquid Soap with Actamer® for daily use throughout the plant. It's a real germ-killing soap that destroys up to 97% of all bacteria on the skin when used regularly . . . and leaves a protective film on the skin which continues to kill germs. Won't irritate normal skin. It costs little more than ordinary soap.



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Attractive plastic dispenser bottle free with trial order for one gallon or more.

Write today for prices and more information.

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## PLANNING THE OFFICE

**EFFICIENCY**, convenience and safety require careful planning in the office as well as in the factory. The essentials of a good working environment vary only in details with the nature of the operations.

Many of the principles of work flow apply to all workplaces.

Light, ventilation, washrooms and other employee services have an important influence on employee morale.

Housekeeping has values far beyond the appearance of the office and its influence on employees and visitors. It contributes to health and to the elimination of slipping and tripping hazards.

The following basic details should be considered:

### 1. Layout

Work should flow through the office with a minimum of backtracking.

Transportation distance of work should be at a minimum. Where possible, desks should be arranged so that each worker will receive his work from the person behind or beside him.

Files should be placed against walls or railings.

Desks should face in the same direction for most office operations. Where two employees are working together, they may face each other.

Employees using the same machine should be grouped.

Heavy equipment should be placed against walls or columns.

Employees should be placed in front of or around the person having supervision over them.

Those having frequent callers should be near entrances.

### 2. Space

Growth of a business sometimes results in installing more desks and other equipment than original plans called for. Overcrowding is bad from the standpoint of both appearance and the psychological effect on employees and it may also overtax existing ventilation facilities.

A suggested minimum width for aisles is 4 feet. For desks facing in the same direction, distance between the back of one desk and the front of another should be not less than 3 feet. More space per employee is, of course, highly desirable.

### 3. Light

Fluorescent lighting fixtures, with their high efficiency and low current consumption, are making the office increasingly independent of daylight

## COTTERMAN WELDED STEEL SAFETY LADDERS For Filing Rooms—Stock Rooms—Vaults



45"—5 Step

New Improved design now being made from 1" diam. round furniture tubing.

Mounted on Swivel Brake Casters which allow the ladder to be rolled freely when no one is on it. When you step on the ladder the rubber cushioned legs rest on the floor and prevent rolling.

Made in 7 heights: — 18" 2 Step,  
27" 3 Step, 36" 4 Step, 45" 5 Step,  
54" 6 Step, 63" 7 Step, 72" 8 Step.

All are made in 18", 28" or 24" width. Send for Circular No. 63-N and prices on these ladders and our full line of Wood Rolling Ladders.

Manufactured by

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A trial will convince you.  
Send for **FREE SAMPLE**.

## TAMMS INDUSTRIES, INC.

Dept. RM10 - 225 N. La Salle St. Chicago 1, Ill.



and permitting more efficient use of available space.

If the office depends largely on daylight, employees engaged in the most exacting visual tasks should be located nearest the windows. North light is preferred by draftsmen and artists.

Employees should not face windows, unshielded lamps or other sources of glare. Wall and other surfaces should conserve light while avoiding annoying reflection.

#### 4. Ventilation

In many offices the defects of window ventilation are quite obvious. Persons by the windows may get too cold and those farther away may be too warm. Where there is much interior space forced ventilation may be needed. Such installations should be planned and installed by experts. More and more offices are being air-conditioned but many will have to get by with natural ventilation for some time to come.

#### 5. Noise

Sound-absorbing materials are being used increasingly for ceilings, even where normal noise is not considered excessive. Noisy machines should be segregated.

#### 6. Electricity

Dictating machines, adding machines, electric typewriters, desk lamps and other equipment require outlets and extension cords. These should be arranged to avoid tripping hazards.

#### 7. Floor Maintenance

Defective tiles or boards should be repaired immediately. Floor finishes should be selected for anti-slip qualities. Special care is needed on stairways and at elevator entrances.

#### 8. Glass Doors

These should be painted with some conspicuous design near eye level to prevent persons walking into them.

#### Common Sense Precautions

Extension cords should be examined occasionally for signs of wear. Heavy rubber cord is desirable where it is subjected to hard use.

\*\*\*

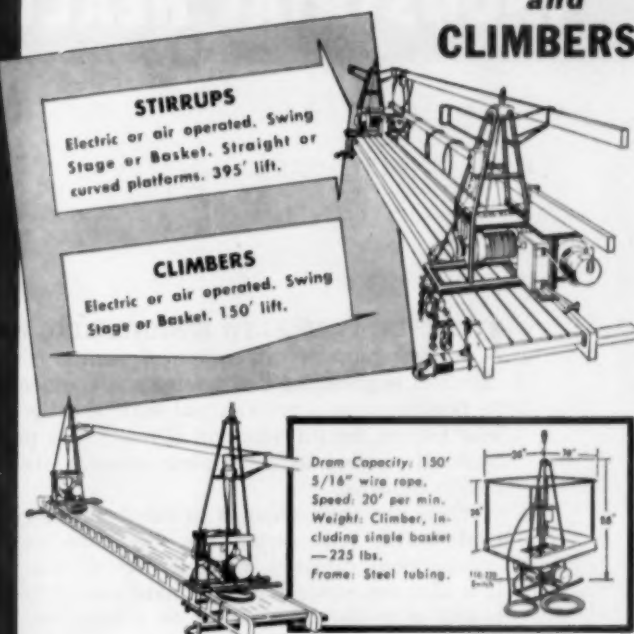
Insulation alone is usually not adequate to protect woodwork from nearby heat sources. Well-ventilated space is also needed.

\*\*\*

Combustible waste should be removed from buildings at the close of each working day.

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for safety  
and efficiency!**

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867 S. Water—Saginaw, Michigan

# INDUSTRIAL HEALTH ENGINEERING

**I**NDUSTRIAL HEALTH ENGINEERING might be described as a combination of sanitary engineering, chemical engineering and mechanical engineering. It had its beginning on a professional scale shortly after World War I when the introduction of many new processes and materials caused industry some concern about potential health hazards.

While the great impetus to the development of industrial health engineering has been the prevention of occupational diseases, its activities do not stop there. It is also concerned with the maintenance of the general health of industrial workers on a high level.

Attaining these objectives requires the combined efforts of many persons, including engineers, physicians, chemists and nurses. It might be said that the physician and nurse are concerned with the well-being of the individual. The engineer and chemist are concerned with the environment. While the physician examines the worker, the engineer examines the workplace. Both are needed in the maintenance of health.

Industrial hygiene has been defined as the science of maintaining the working environment in a condition conducive to health, which means keeping all harmful exposures away from the worker.

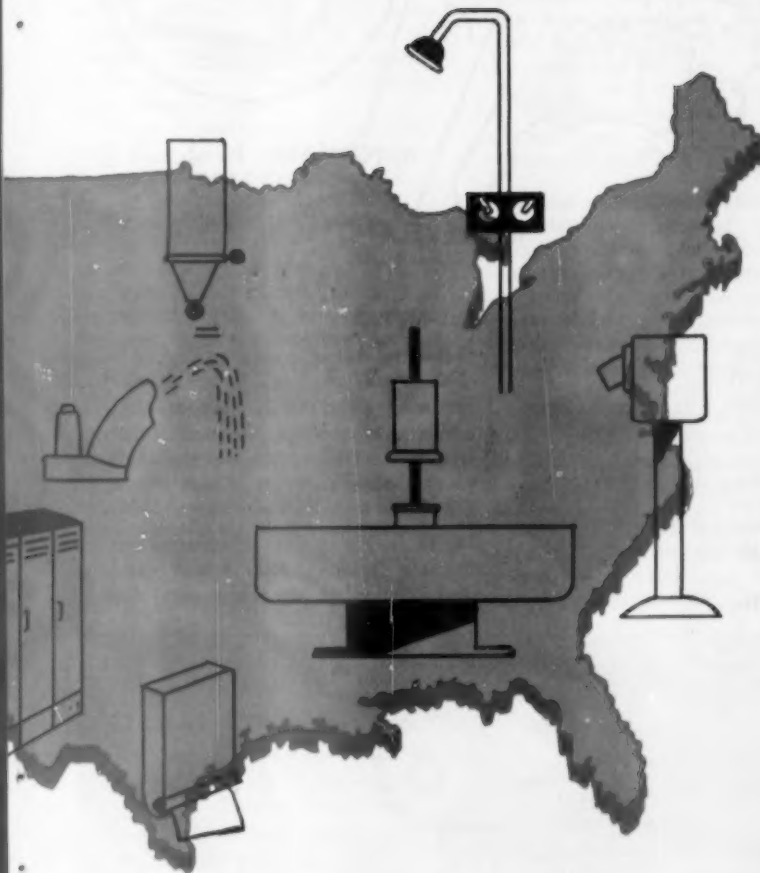
These harmful exposures include excessive concentrations of dusts, gases, vapors and other air contaminants; high or low temperature and high humidity; harmful amounts of radiant energy, such as infra-red, ultra-violet, X-rays, radium emanation; noise; inadequate illumination. The atomic age is bringing new problems for the industrial hygienist.

The industrial hygienist is concerned with all factors which have a favorable effect on health, morale and efficiency, even when they involve no immediate and spectacular menace to health. He is therefore interested in those items described as employee services, such as sanitary facilities, food services, drinking water.



# INDUSTRIAL HEALTH ENGINEERING

3



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# SALT SUPPLIERS FOR THE NATION



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The attractive, sanitary, low-cost dispenser that has captured the fancy of industrial buyers and men-in-the shop . . . the Fairway "Crystal" dispenser. Tablets are sealed in at our plant . . . and there is no re-filling . . . no servicing! Cost of the "Crystal" is so low, the dispenser is discarded when empty. Available in 500 or 1,000 tablet size.

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Guaranteed five years against mechanical failure, StaSafe metal dispensers are rugged . . . sanitary . . . and easy to operate. Made of corrosive-resistant alloy, they are designed for the heavy demands of busy plants. They come equipped with lock and key.

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This coating prevents the tablet from dissolving prematurely and causing the all-too-familiar sickness and ill effects suffered by many.

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# VENTILATION

**VENTILATION** may be defined as providing the general air requirements for the health and well being of the occupants of an enclosed space. This can be done by supplying air to or removing it from the space in question. This may be accomplished by either natural or artificial means.

Where processes are not injurious to health, general ventilation is usually satisfactory. It is also satisfactory where dilution of the air contaminant will keep the concentration below permissible limits for continuous exposure.

Where toxic materials are handled, it is necessary to remove the contaminants at their source.

**Air conditioning** includes control of temperature and humidity as well as air motion and removal of contaminants. This means cooling and dehumidifying the workroom air in summer. It also means heating and humidifying in winter.

Comfort air conditioning for hot weather has become almost universal in theaters and is being installed in an increasing number of restaurants, stores and offices. Control of temperature and humidity in industrial plants is still influenced chiefly by the requirements of products and processes, which are not always best suited to human comfort.

Air conditioning and modern lighting systems make the plant practically independent of the climate outdoors. The self-sufficient building may be windowless or it may have fixed sashes to give the occupants a glimpse of the outdoors for psychological reasons.

## General Ventilation

Ventilation is often made more expensive and complicated by the necessity of maintaining a comfortable temperature in the room. Exhausting impure air is usually practicable but in cold weather it may be difficult and expensive to warm large volumes of incoming air.

**Natural ventilation** is adequate for some buildings housing non-hazardous operations. Air circulation is aided by doors, windows, roof ventilators and monitors. The number of outlets should be planned for hot weather when the temperature difference inducing the draft is at the lowest point.

Air intakes should be located so that incoming air is properly tempered and does not cause uncomfortable drafts in cold weather.

**Artificial general ventilation** requires properly located inlets and outlets. Air coming into the room must be uncontaminated and dis-

charge points should be located to avoid recirculation.

When the contaminant is heavier than air, openings at floor level permit its escape.

**Fans and blowers.** Both portable and stationary types are useful for increasing circulation of air which affords relief from heat. They are not substitutes for exhaust ventilation where air contaminants should be removed.

For moving large volumes of air blowing is more efficient than suction.

Devices for air circulation become less effective as temperature and humidity rise.

Caution should be used in air movement, particularly with velocities over 200 fpm. When relatively cool air is blown over workers at high velocity objectionable drafts are created.

## Dust and Gas Problems

Dust problems are usually more difficult than control of gases, vapors, mists and fumes. Dusty operations tend to project particles so that the hood must provide velocities sufficient to draw them into the exhaust system.

Exhaust hoods should be enclosed as completely as possible or the hood should be located to take advantage of the directional effects of the dust flow.

Dust removal systems generally require higher air velocities and ducts of heavier gauge metal than those designed for gases.

## Control Measures

Where there is a definite source of air contamination, general ventilation alone is seldom sufficient. Control involves three steps:

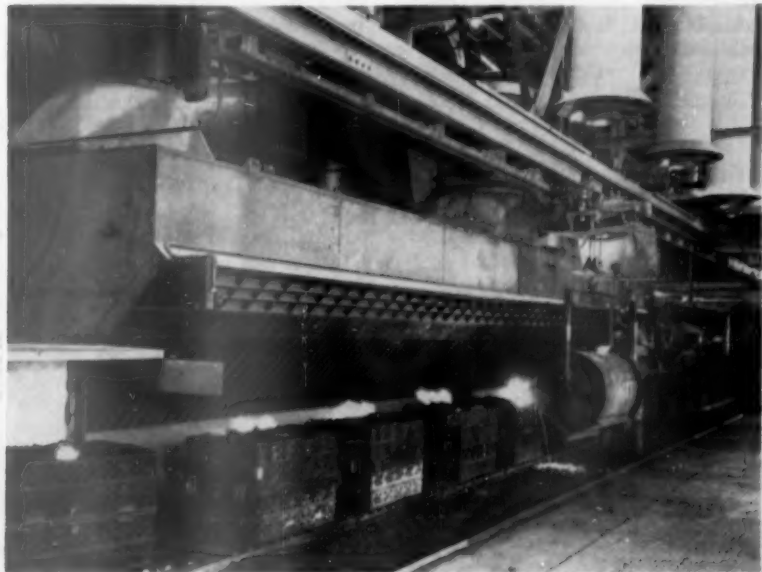
1. Identifying the substance and locating its source.
2. Atmospheric sampling to determine nature and extent of contamination.
3. Engineering control measures.

Control at the source may involve one or more of these measures:

1. Isolation or enclosure of the hazardous operation.
2. Local exhaust ventilation.
3. Operational changes involving substitution of process or materials.

**Isolation** confines the operation to a definite location. Exposure of workers is either eliminated or restricted to a few selected, trained and equipped operators.

Examples of combining exhaust ventilation with isolation and enclosure are: sandblasting rooms, shake-



Efficient ventilation for a foundry. Fresh air enters through the pipes above the pouring station and smoky air is immediately exhausted through the hood overhanging the molding line. (Ford Motor Company)

out and tumbling-barrel operations in foundries, dry mixing, and mixing of volatile liquids.

Processes creating excessive heat, humidity or noise should also be isolated wherever possible.

### Local Exhaust Systems

Local exhaust systems are an important means of occupational disease control. Their purpose is to create a sufficient movement of air to withdraw contaminants at point of origin and convey them to a safe point for disposal.

An exhaust system consists of four major parts:

1. Hoods or enclosures near source of contaminant.
2. Piping to connect hoods into system.
3. Collection equipment.
4. Fan.

Each part has its independent function but all must be designed to work together efficiently.

The exhaust hood is the most important part of the system. It should enclose the process as completely as possible. Air velocity decreases approximately with the square of the distance from the hood opening.

Air velocity for effective control varies with the process and material exhausted. Generally speaking, the better the enclosure and design of the hood, the less need for high velocities.

Hoods or enclosures may be in the form of booths, canopies, lateral hoods, downdrafts through grill openings below the process, or slot-type hoods. The object in each instance is to remove the contaminant

without drawing it through the breathing zone of the operators and with minimum interference with processing.

Efficiency of hoods can be increased by addition of flanges.

Ducts connect the hoods to the central fan, distribute the air flow in direct proportion to the requirements of each inlet, and maintain adequate pipe velocity to convey the contaminant to the point of discharge.

The system should be balanced so that each hood draws the proper amount of air. When this condition has been obtained, all means of adjustment should be permanently fixed. The areas of branch pipes and main ducts can be calculated to give the correct air velocities throughout the system.

Material used for ducts must resist abrasive action of dust or corrosive effects of gases and vapors.

Sharp turns in ducts should be avoided. They take extra power and cause a large pressure drop.

Traps with clean-out gates should be provided at the bottom of vertical runs, and clean-out gates at regular intervals on the bottom side of horizontal runs.

Fans should have a capacity slightly higher than calculated requirements to allow for leakage in the system, accumulation of material on fan blades, and similar difficulties.

Where the contaminant is hot and has a natural tendency to rise and the operation can be provided with an effective enclosure type hood, natural draft ventilation is often satisfactory.

### Disposal of Contaminants

Equally as important as collecting the air contaminants is its proper disposal. Gases, vapors and mists may often be discharged to the outside atmosphere at a point where they will not recirculate around the premises in harmful concentrations.

Dusts, both harmful and nuisance, require the use of dust collectors in the system.

Recirculation of air from exhaust systems is not generally desirable, particularly when the air has contained gas or fumes. Where only nuisance dusts are involved, recirculation after cleaning is often permissible.

Recirculation is not desirable when dusts containing such substances as lead, silica, asbestos are handled.

Air coming from the cleaning device must fall within the permissible range for toxic or flammable dusts.

### Dust Collectors

Methods of removing dust from the air exhausted by the system include:

1. Filtration
2. Electrical precipitation
3. Wet collectors
4. Dynamic precipitation
5. Supersonic flocculation

Filters are the oldest and simplest way of removing dust. They are porous mediums through which dust-laden air is drawn. Some filters are designed to collect dust in the form of a layer on the upstream surface. This is characteristic of cloth and paper filters. The thicker types, such as those of metal mesh

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## Limits for Variables Influencing Comfort and Safety

Ross A. McFarland in *Mechanical Engineering*, May 1954

Variable	Desirable	Max or min value for comfort
Ventilation .....	Sufficient additional fresh or recirculated odor-free air to remove all odors	20 cfm of fresh air
Air temperature ....	Ambient temperature adjusted to give effective temperature of 63-71 ET (winter) or 66-75 ET (summer)	70-72 F dry bulb
Air velocity .....	Adjusted to ambient temperature to give appropriate cooling power without drafts	40-60 fpm
Humidity .....	Adjusted to air temperature and velocity to maintain comfort	25-50 per cent relative humidity
Carbon dioxide .....	Not a requirement as long as ventilating requirements for removal of odors are met	0.5-1.0 per cent
Carbon monoxide ..	None	0.003 per cent
Noise .....	Reduced to permit conversation at least 3 ft with no extra effort	80-85 db over all and 50-60 db in 1200-2400 band
Vibration .....	Reduced to below threshold of perception	0.002 in. at 20 cps or more

# WASH AND LOCKER ROOMS



Washfountains permit efficient use of space for group washing. Lockers have sloping tops which prevent storage and accumulation of dust.

**PERSONAL CLEANLINESS** is recognized as essential to health and comfort and supplying the necessary facilities is one of industry's responsibilities. Well-equipped and well-maintained washrooms, toilets and lockers attract desirable workers and help to keep them happy on the job.

High standards of sanitation can be achieved most economically when buildings are being planned. Attention to these requirements at that stage will insure sufficient space and convenient location. Otherwise facilities may have to be fitted later into less convenient space.

Engineers and architects specializing in the design of industrial buildings understand the importance of personal service facilities, and how to plan them for economies in installation. Good planning also minimizes loss of time between job and washroom.

Facilities which were adequate when installed may not have kept pace with plant expansion. A survey of present equipment checked against the number of employees will show whether additions are needed. Also, equipment should be examined critically by modern standards of sanitation and appearance.

**Location.** Lockers, lavatories and toilets may be in one central location or scattered through the plant, depending on layout of departments and type of operations.

In smaller plants, washrooms and lockers are usually near the entrance.

Toilets should not be more than 200 feet away from any work place. In multi-story buildings, one on each floor is desirable. If that is not practicable, they should not be more than one floor above or below the work place.

Washrooms in large one-story buildings usually are scattered throughout the building. Where there are many small isolated buildings, as in chemical plants and railroad yards, or where much of the activity is outdoors, a separate building may house all these facilities.

Accommodations should be located so that employees will not have to cross highways or railroad tracks to reach them.

When lockers and washrooms of a large plant are near the main entrance, small rooms with lavatories and toilets are often scattered through the plant. This saves the workers' time and makes it possible to close the main room during working hours, lessening danger of theft and requiring less supervision.

Separate washrooms and lockers are desirable for departments where there is exposure to excessive dust, dirt, heat, vapors, or moisture. These need more lavatories or shower baths than cleaner departments.

Offsetting the advantages of scattered facilities is the higher cost of installation and maintenance.

Centralized toilet and washing facilities are often preferable where women are employed. In some plants a full-time attendant may be needed.

In some large plants with underground passageways connecting buildings and departments, personal service facilities are often located along them, conserving space for manufacturing operations. Another space-saving method is to locate them on balconies.

**Light.** Fixtures should provide sufficient light in all parts of the room. Walls, ceilings and partitions should be light in color to conserve light and encourage cleanliness.

**Ventilation.** Unless the washroom has sufficient outside windows for natural ventilation, forced ventilation will be needed.

**Floors,** and walls to a height of at least six inches, should be of impervious material, such as glazed tile or concrete with good friction characteristics.

Walls should form a tight joint at the floor level, or there should be a cove base at least six inches high. Walls should be impervious to water to a height of at least five feet. All wall and ceiling surfaces should be washable.

## Wash Fixtures

**Group washing equipment.** In industrial plants, institutions, schools and other establishments where facilities must be provided for large groups, circular wash fountains are the most frequent choice.

Eight to 10 users can be accommodated at a 54-inch circular fountain and 5 to 6 at a 36-inch unit. Fewer valves and plumbing connections mean additional economies in installation and maintenance.

Economy of water is another advantage. Several persons washing at a circular fountain use little more water than one at an individual basin. Each user washes in clean running water of regulated temperature. A foot or hand-controlled mechanism regulates the flow.

Semi-circular units 36 or 54 inches wide mounted against a wall are used for narrow or irregular washrooms.

Precast stone and marble are the most frequently used materials. Some models are also available in enameled iron and stainless steel.

**Individual basins** of vitreous china or enameled iron make an attractive

—To page 74



# **ONOX** **Skin Toughening** **STOPS** **ATHLETE'S FOOT!**



That's why **OVER**  
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of the largest manufacturers  
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**USE ONOX**  
in shower rooms!

**NO TROUBLE TO USE**  
No splash, no mess, easy to maintain. Nothing to get out of order.

**MAKE 60 DAY TEST**  
We will ship trial order for any amount of ONOX and footmats. You pay nothing unless fully satisfied after 60 day test.

## **TOUGHENS SOFT SKIN**

Main cause of Athlete's Foot is Shoe-Softened Skin (U.S.P.H.S. Bul. R-674). ONOX Mineral Salts toughen soft skin and make it resistant to fungus growth.

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## **SKIN INFECTIONS**

**NO OCCUPATION** seems to be exempt from skin infections, and even normally harmless substances can irritate the skins of some unfortunate individuals.

While rarely a cause of death, these infections cause a vast amount of discomfort and frequently are difficult to cure. It has been estimated that they are responsible for as much as 60 per cent of all compensation claims for occupational diseases.

### **Types of Infections**

There are two general types of skin infections in industry:

**1. Primary irritation dermatitis.** Practically all persons suffer skin irritation from acids, alkalis, irritant gases and vapors, and physical agents, such as heat, cold and friction. Brief contact with a primary irritant in high concentration or prolonged exposure to a lower concentration results in inflammation. Allergy is not a factor in these conditions.

**2. Sensitization dermatitis** is the result of skin sensitivity to a given substance. This form requires a definite period of sensitization. During this period the offending substance causes no response unless there is contact with concentrations high enough to cause primary irritation. Once sensitization develops, even small amounts of the material may cause symptoms.

Some substances can produce both types of dermatitis. Among them are organic solvents, formaldehyde and chromic acid.

### **Infections from Cutting Oils**

Cutting oils and compounds are frequently involved where cutting and turning of metals is performed. The condition starts with irritation of the skin by continuous contact with the oil, forming comedones or blackheads. These comedones later become infected to form oil pimples or boils.

Dirty workers working in dirty oil form a combination that often results in serious conditions. Some types of skin are more susceptible than others, but anyone will develop the condition with sufficient exposure.

If other precautions are taken, use of protective creams will help, primarily by making it easier to cleanse the skin.

Keeping machines and the area

around them free from loose oil is the basis of any program for the control of oil dermatitis.

To prevent excessive deterioration of oil it should be replaced and the machine thoroughly cleaned after each 120 hours of use, or oftener. The oil may be reclaimed or replaced, depending on which is cheaper.

If reclaimed, it may be sterilized by heat during the process. Caution should be used in adding germicides to oil. Most of them are irritating to the skin if used in excessive amounts.

Oil dermatitis occurs most often on the front of the thighs and the back of the neck, where clothing rubs, also on forearms and wrists where direct contamination is heaviest. Men working in the area must keep clean and not wear oil-soaked clothing.

Men should be encouraged to bathe daily at the end of the shift. A shower with warm water, mild soap or detergent, and a soft brush is helpful in the control of skin infections.

**Predisposing factors.** In investigating causes of occupational skin disorders, the following should be considered:

1. Race of patient.
2. Type of skin.
3. Age.
4. Sex.
5. Degree of perspiration.
6. Personal habits of cleanliness.
7. Pre-existence of skin disorders and allergic states.
8. Diet.

**General precautions.** The primary objective is to prevent contact with the irritant or reduce it as much as possible. Use of enclosure and mechanical methods of handling will reduce skin contacts.

Personal protective equipment, such as gloves, aprons, and face shields, and protective creams are a second line of defense. Careful housekeeping around the process is also essential.

Personal cleanliness, which shortens the contact of the material with the skin, is at least as important as personal protective equipment. Selection of a skin cleanser and developing habits of cleanliness should also receive attention.

Attempts to determine which individuals are especially sensitive to contact with these materials, by patch tests or otherwise, are of doubtful value.



# COPPUS "BLUE RIBBON" VENTILATORS

identified by the blue band

## FOR WORKERS'

- Safety
- Health
- Comfort
- Efficiency

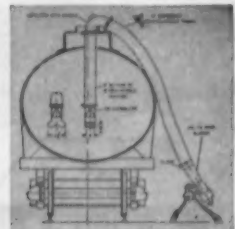


## VANO® Design "A" VENTILATOR

Vano Design "A" cooling interior of furnace, supplying fresh air through 10 feet of "Ventube" to provide safety and comfort during repair work.

Vano Design "A" delivering fresh air to cable manhole, expelling sewer gas, making entrance safe in a few minutes.

Vano Design "A" Ventilator plus a few accessories feeds large air volume into tank car, driving out fumes, stagnant air and air for workers' safety and comfort.



Vano Design "A" supplying fresh air in Reactor Room of Synthetic Rubber Plant.

Vano Design "A" Ventilator supplying fresh air to men working in wing compartments, fuselages, etc.



Powered by a 1/2 hp motor, and equipped with the exclusive Coppus axial-flow propeller-type fan, this general-purpose blower delivers 1500 CFM of fresh air. It supplies ventilation for tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments and fuselages, and other confined places. Weighs only 103 lbs. Uses 8"-diameter flexible canvas tubing ("Ventube").

### VANO DESIGN "C"



### VENTILATOR-EXHAUSTER



Vano Design "C" equipped with 8" discharge tubing removing welding fumes.

Vano Design "C" equipped with two suction lines removing welding fumes for operator's safety.



For withdrawing welding fumes from confined places or directly from the welding rod ...or for expelling fumes or hot air from enclosed vessels. You can get it with 8" suction inlet for 8" non-collapsible tubing ...or with multiple inlet nozzles for 5", 4" or 3" suction hose. The discharge outlet takes 8" "Ventube". Powered by a 1/2 hp motor, it weighs only 85 lbs.

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Please send information on the Blowers that clear the air for Action.

- ☐ in tanks, tank cars, drums, etc.
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- ☐ motors, generators, switchboards.
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- ☐ general man cooling.
- ☐ around cracking stills.
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NAME .....

COMPANY .....

ADDRESS .....

CITY .....

(Write here any special ventilating problem you may have.)

**COPPUS "BLUE RIBBON" PRODUCTS—Designed for Your Industry. Engineered for You**

# DRINKING WATER

**THE HUMAN BODY** contains a large percentage of water which is constantly being depleted through elimination, breathing and perspiration. It must be replenished frequently to protect comfort, health and efficiency.

Employees will not drink enough water unless facilities are conveniently located and the water is cool and palatable. Clean and attractive fixtures are also important, particu-

larly for women employees and customers.

In providing facilities, the following should be considered.

1. Number of persons to be served
2. Type of work—light or strenuous
3. Temperature of workroom
4. Purity of water
5. Temperature of water
6. Design of fixtures
7. Location of outlets

One outlet for every 50 persons is a recommended minimum for industrial establishments. If temperature is high or work involves considerable physical exertion, more will be needed.

It should not be necessary to walk more than 50 feet for a drink. If outlets are too far apart, employees will not drink enough water or they will spend too much time away from work.

All rooms assigned for eating purposes should have a supply of drinking water. No drinking facilities should be installed in toilet rooms.

**Water supply.** Municipal health departments maintain a close watch over the water supply. But when the plant is located outside the city limits, and for temporary operations such as construction, public utility and oil-field work, the employer must supervise the water supply. It should be analyzed regularly.

If unapproved or "service" water is used for industrial processes or for fire protection, signs should be posted warning against its use for drinking. Care must be taken to avoid possibility of cross connections between the two systems.

**Sterilization.** Water of questionable purity can be made safe for drinking by chlorination or boiling. Compounds for sterilizing water, some in convenient tablet form, are available.

**Filtration** is desirable for removal of sediment but it will not destroy harmful bacteria.

**Temperature of water.** For workers who perform heavy manual labor, from 50 to 55 degrees F. is recommended. For office workers, restaurant patrons and others who are less active, the temperatures may be as low as 45 degrees.

## Methods of Dispensing

Two approved methods of dispensing drinking water are: (1) Fountains of approved design; (2) Paper cups provided at the outlet.

**Drinking fountains** with individual cooling units are more suitable for many types of industry than a central cooling system. Fountains should conform to specifications of the ASA Code Z 4.2. Important features are:

1. An angle jet, which prevents the water falling back on the nozzle.
2. A guard to keep the user's lips away from it.

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**DANGER! DANGER! DANGER! DANGER!**



**SAFE!**

**CLEAN PARTS**  
AUTOMOTIVE & INDUSTRIAL  
**--- 3 WAYS!**

1. Continuous Flow Hose
2. Air Agitated Soaking Tank
3. "Super Power" Jet Air Gun



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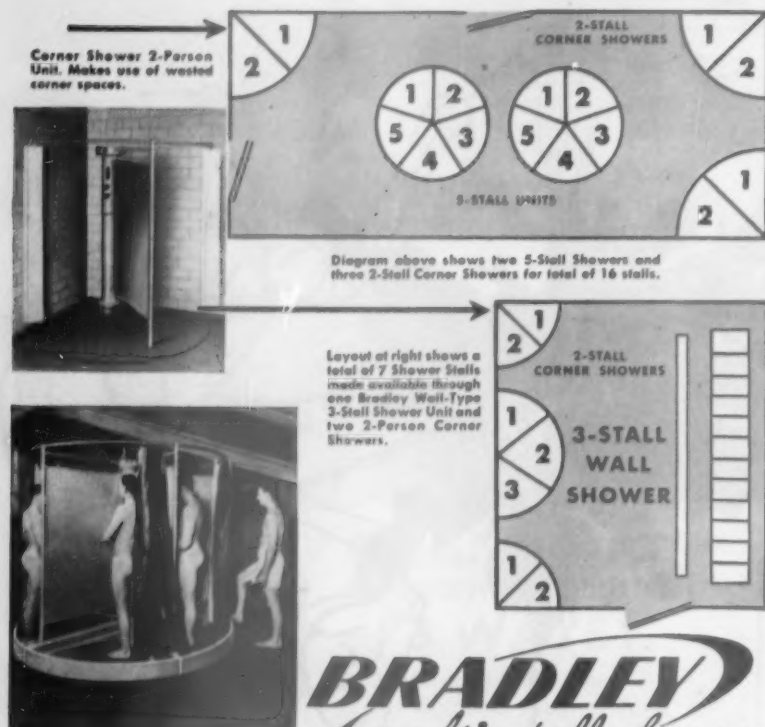
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H3

# ECONOMICAL SANITARY SHOWERS for large and small rooms



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To study the details of modern Bradley Showers, refer to our Catalog 5204. Write for a copy today. **BRADLEY WASHFOUNTAIN CO.**, 2237 West Michigan Street, Milwaukee 1, Wisconsin.

Bradley Washfountains and Showers are Distributed Through Plumbing Wholesalers



Write for Catalog 5204

## Drinking Water

—From page 66

Older installations in factories, offices, stores and public buildings which do not conform to hygienic standards can often be modernized at reasonable cost.

Desirable accessories in drinking fountains are line strainers and pressure regulators. An outlet for filling glasses is also useful, particularly for office use.

**Salt tablets.** A dispenser should be located near the drinking fountain.

**Hazardous locations.** For use where flammable gases, vapors and dusts may be found, explosion-proof fountains are available.

**Paper cups** should be kept in dust-proof containers and receptacles provided for used cups. The container must be kept filled or workers will salvage old cups.

**Maintenance.** A cuspidor or sand urn should be provided at each fountain to receive discarded chewing gum, tobacco, etc. Regular cleaning of porcelain and metal keeps the fixtures attractive and sanitary.

## Isolated Jobs

**Portable containers.** For jobs remote from city water mains, such as construction work, public utilities and railroad maintenance, mining, and other isolated working places, there are safe and convenient methods of providing drinking water. It is not necessary to depend on an open bucket with one cup or dipper for the whole crew.

Insulated coolers, with dispensers for paper cups are frequently used. The container should have a tight-fitting cover.

Portable drinking fountains provide another method. Pressure is maintained with a hand pump and slight pressure on a valve releases a jet of water at an angle, as in approved permanent installations and a guard keeps the lips away from the nozzle. Insulation keeps the water cool for several hours.

Vacuum bottles for individual use may be provided for remote or hard-to-reach places, such as crane cabs.

If it is necessary to depend on a local water supply of uncertain purity, the water may be made drinkable by tablets available for this purpose.

**Salt tablets.** In many isolated jobs men perform strenuous work under the hot sun and perspire freely. Salt tablets may be issued to them in individual packages.



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**HOSPITAL-CLEAN IN 30 SECONDS**



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THE ARISTOCRAT OF ALL GRANULATED SKIN CLEANSERS

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Yes, in just half a minute Pax gets workers' hands clean as a surgeon's blouse, removes grime and grease from even the stubborn spots around fingernails and hair follicles. What's more, by chasing germ-laden dirt, Pax helps prevent claim-heavy industrial dermatitis, industry's number one occupational ailment.

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# HEAT AND HUMIDITY

**EXCESSIVE HEAT**, whether due to climate or to manufacturing processes, provides some of industry's most complicated and expensive problems. The loss of productive efficiency at high temperatures is serious and human health and comfort are affected to a greater or lesser degree.

Accident rates are also influenced by the lack of alertness caused by excessive heat and humidity.

When temperatures approach 90 degrees, especially when accompanied by high humidity and lack of air movement, the human body rapidly loses its ability to compensate for atmospheric conditions.

Individuals vary considerably in their susceptibility to heat but it is good economics to cool the air of working spaces as much as possible in summer and to protect workers exposed to heat-producing processes.

Avoiding the ill effects of heat and humidity requires close attention to working conditions by the employer and observance of reasonable precautions by the worker. Even where air conditioning is not practicable much can be done to improve conditions.

**Ventilation** is one of the most important items. Keeping the air in circulation by general mechanical ventilation is helpful and spot cooling by fans often affords increased comfort. However, when the wet bulb temperature of the surrounding air is higher than that of the body, blowing air over the worker does not cool him, it makes him feel more uncomfortable.

In industries where heat is excessive, such as hot mines, glass plants, and steel mills, it is frequently useless to blow air over workers unless it is cooled and dehumidified.

In hot industries there are many operations in which the atmosphere cannot be kept below maximum suggested temperatures. Radiation from nearby hot objects is another source of discomfort. Heat received through radiation can be decreased by means of shields or insulation where fans would be ineffective.

Adequate washroom facilities and plenty of cool, pure drinking water also contribute to health and comfort in hot surroundings.

**Work clothing.** For general conditions of heat and humidity, clothing

should be porous, light in weight and allow air to circulate around the body.

For exposure to local sources of intense heat and infra red and ultra violet radiation, special protective garments are needed. Leather is widely used, and more severe exposures, asbestos and wool are needed.

## Acute Ailments

Exposure to extreme heat, especially when accompanied by physical exertion, may result in heat cramps, heat exhaustion, or heat-stroke. Knowledge of correct first aid treatment for each type of ailment is important. All cases should receive medical attention.

**Heat cramps** are due to excessive loss of salt and moisture from the body. They come suddenly and may involve skeletal or intestinal muscles. Even if the moisture of the body is replaced by drinking plenty of water, loss of salt may cause heat cramps.

Heat cramps are relieved in a few hours by proper treatment but soreness may persist for several days.

**Heat exhaustion** is a shock-like state also resulting from loss of salt and moisture. Symptoms are pallor, relatively low temperature, weak

—To page 72

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**PROTECTS** against initial contact.

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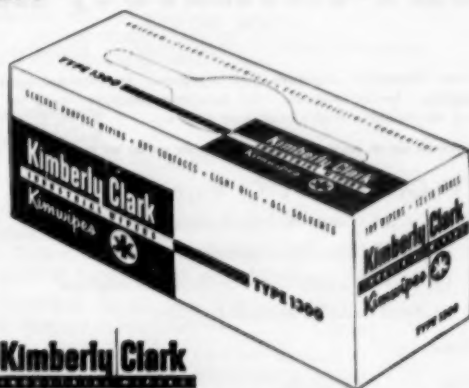
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## Heat and Humidity

—From page 70

pulse, a feeling of restlessness or anxiety, and sometimes unconsciousness. It is a much more severe condition than heat cramps and is occasionally fatal. A person with either condition should be given salted water, if conscious, and put under medical care as quickly as possible.

**Heatstroke** (also known as sunstroke) is caused by exposure to an environment in which the body is unable to cool itself sufficiently. It is not necessarily the result of exposure to the sun. As a result, body temperature rises, and the heat-regulating mechanism breaks down.

Symptoms are severe headache, flushed face and high temperature, visual disturbances and loss of consciousness. Death may occur within a few hours, but if timely treatment is available the patient has a good chance of recovery. One of the after-effects is inability to withstand heat.

In general, the same precautions will help to prevent or minimize all types of disability due to heat.

Serious exposures include boiler and engine rooms, foundries, steel mills and glass plants. Seasonal heat hazards are found in construction work, public utility, highway and railroad maintenance, and farming.

**Sunburn** can be painful and dangerous. In strong sunlight, the head should be covered and exposure of the skin kept at a minimum. Tan should be acquired gradually. Treatment is the same as for any other type of burn.

## Use of Salt

Maintaining the salt in the body at an adequate level enables men to work at strenuous occupations where temperatures are unavoidably high. For sedentary workers, normal use of salt with food may be sufficient, but those whose jobs require greater physical exertion may not take enough by this method.

**Dispensing.** The most convenient and popular method for providing salt is in tablet form. The 10-grain size is more frequently used, and it may be obtained either as pure salt or in a combination of 70 per cent salt and 30 per cent dextrose. Tablets containing dextrose are more palatable and more easily assimilated by many persons. Diabetics should be warned against tablets containing dextrose and plain tablets should be provided for their use.

For those who find difficulty in



taking even a moderate amount of salt, enteric-coated tablets are available. These pass through the stomach intact and dissolve in the intestines.

In most plants, a dispenser for salt tablets will be found beside the drinking fountain. Dispensers are made in several styles and sizes.

The drink of water is as important as the salt. A full glass of water (eight ounces) should be taken with each tablet.

Another method is to add salt to the water. This is practicable where the drinking water is not used in the industrial processes. Concentrations of from .1 to .5 per cent, depending upon the temperatures and nature of the work, are used in some plants.

Use of salted drinking water should be under medical supervision.

**Caution.** Persons with kidney or heart disease or high blood pressure should seek medical advice on the use of salt. However, such men should not be placed on jobs where they would be exposed to high temperatures or heavy manual work.

### Controlling Air-Borne Bacteria

Control of air-borne bacteria in industrial and public buildings has been the subject of much research. In addition to the personal health aspect, control of such bacteria is sometimes required by manufacturing processes.

Ultra-violet radiation and chemical bactericides will destroy bacteria, but practical methods of application impose numerous difficulties.

Ultra violet radiation using low-pressure mercury lamps with ultra violet transmitting glass or quartz envelopes will destroy many micro-organisms. Application is by irradiating the upper air stratum of a room, beaming or screening to provide a narrow barrier of protective light, or inserting a radiation source in an air duct.

Radiations of sufficient intensity to kill bacteria are dangerous to eyes and skin. Lamps should not be in the range of vision.

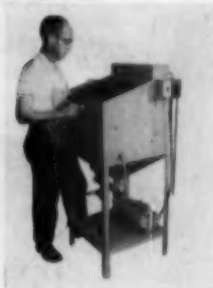
Chemical bactericides are also used, propylene glycol being the most effective under most conditions. Effective concentrations are odorless and non-toxic to human beings.

Use of chemical bactericides requires close control of humidity in the area to be protected.

## FINE ORGANICS' 'SAFE-TEE' SOLVENT F.O. 128 GOES TO WORK FOR INDUSTRY



Actual photographs of machines designed and built by **MARTIN AIRCRAFT, Baltimore, Md.** for cleaning and degreasing large and small parts with F.O. 128



**FINE ORGANICS** is proud of the part it plays in helping **THE MARTIN CO.** perform an effective cleaning operation on both large and small parts. Many leading organizations are finding **F.O. 128** not only a reliable cleaner but a decided factor in the elimination of personnel health hazards and wasted man hours.

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find the high flash point makes the use of this solvent desirable wherever fire hazards prevail.

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recommend replacing Carbon Tetrachloride with **F.O. 128**. Low toxicity aids in avoiding harmful effects on personnel.

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## Wash and Locker Rooms

—From page 63

installation where comparatively small groups are to be accommodated.

Mixing faucets, rather than separate faucets for hot and cold water, are recommended. Hot and cold handles should be plainly marked, with the hot water valve always on the left side. Thermostatic control of water temperature is a desirable safeguard.

Stoppers should not be used. Faucets should permit washing in running water.

Where low first cost is a consideration, enameled troughs may be used. Over these are hot and cold water pipes with mixing faucets spaced not less than 24 inches apart. Double-width troughs, or single-width troughs back to back, save space.

Spray heads at basins or troughs encourage a thorough job of washing. They should be high enough above the trough to permit washing head, arms and shoulders under the spray.

Showers are needed in many industries, particularly where operations are hot or dirty, or where toxic materials are used. Requirements depend upon nature of the processes. They range from one shower for every five men to one for every 15 men.

Shower installations may be of the compartment or the circular multi-stall type.

Floors and approaches should be of slip-resistant material, such as concrete with an abrasive surface. A curb 4 inches high should be erected around shower stalls, to keep water within the enclosure. With adequate slope to the drain a curb may not be necessary.

Painting the curb a contrasting color helps to prevent tripping.

**Emergency showers.** Quick-acting showers should be installed at convenient locations where caustics, acids and other corrosives are handled.

**Eye fountains** are also desirable where chemicals are handled. Prompt flushing of the eyes is recognized as the best first-aid treatment for any chemical in the eyes.

**Fungous infections.** Warmth and moisture in shower rooms are conducive to the spread of fungi that cause "athlete's foot." Floors and stalls should be scrubbed daily with

detergent and water as a general sanitation measure. A germicide in the scrub water is an added precaution.

Careful drying of the feet and use of an antiseptic foot powder are helpful in preventing infection. Preparations for toughening the skin increase resistance to fungi. Pans of antiseptic solution have been found ineffective or worse. Objection to this type of treatment is overcome in a device which dispenses a fresh solution over the feet when the shower user steps on the grating.

**Disposable paper slippers** or wooden clogs keep the feet from contact with the floor. They need not be worn in the stall where the floor area is kept mechanically clean by the flow of water.

#### Skin Cleansers

Three types of skin cleansers are in use: (1) Soaps (2) Sulfonated oils (3) Synthetic detergents.

Powdered soaps are generally more economical than cake soap. These consist principally of powdered hard soap and water softener, to which a scrubbing agent may be added. Cornmeal, a commonly used

scrubber, may be coarse or fine. Most of these soaps can be used with hard water.

Liquid soaps are generally satisfactory where a scrubber is not desired. They are frequently used in office washrooms and in first-aid rooms.

Soap should contain no free alkali and should show a low pH in dilute solution. This can be determined before purchasing.

Sulfonated oils are useful for dry and soap-sensitive skins. They are frequently used where workers are exposed to the defatting action of petroleum oils and organic solvents.

Synthetic detergents of several types, gentle but effective in their action are being used in many industries. They are particularly useful for removing oil, wax and tar.

**Waterless skin cleansers** are a recent development. They are said to be non-irritating and effective in removing grease and grime. Portable dispensers, including a receptacle for waste towels, can be set up quickly where needed and without plumbing connections. Dispensers for paper towels can be attached.

Use of naphtha, carbon tetra-

chloride, turpentine and other organic solvents for skin cleaning should be avoided. Some are toxic, some are flammable, and all have a drastic defatting action. If they must be used to remove substances such as lacquer, which resist ordinary cleansers, emollient creams help to offset loss of natural skin oils.

**Germicidal cleansers.** Ordinary soaps and synthetic detergents remove transient bacteria from the surface but are not effective in reducing those embedded in the skin. Many germicides, such as phenol compounds, have been tested as ingredients of skin cleansers, but required high concentrations that made them unsuitable for daily use.

Hexachlorophene, sometimes described by trade names, has been incorporated in soaps and detergents used for medical, surgical and deodorant purposes and for general industrial and home use.

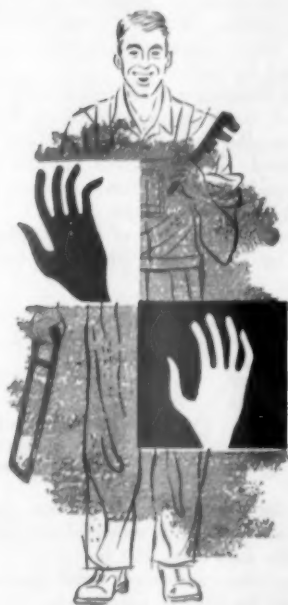
#### Drying the Skin

**Paper towels** meet sanitary requirements and are economical and convenient. Dispensers should be

—Turn page

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## PROTECT YOUR WORKERS



**IMPROVE PRODUCTION:** Stepan ph-6 is a specially formulated, sulfonated oil, bland skin cleanser . . . amazingly effective in removing oils, greases, and other industrial grime. Lotion-like effect actually protects the skin . . .

leaving it clean, smooth, and supple. Stepan also offers a complete line of dispensing methods designed to meet every industrial requirement.

### Neutra-Foam

New mild synthetic skin detergent with excellent foaming properties. Leaves no disagreeable soapy odor on the skin.

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**AJAX® Cups** — one-piece, wedge-shaped, easy to hold and drink from; in 4, 6 and 7 oz. sizes; packed imprinted with assorted stock safety messages at no extra cost or your own message to order.

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## Wash and Locker Rooms

—From page 75

kept filled and receptacles for used towels provided.

Recessed waste receptacles take one more object off the floor, improving the appearance of the washroom and making cleaning easier.

**Mechanical hot air driers** are acceptable from the hygienic standpoint. They are foot operated and may be of the pedestal type or recessed into the wall. Equipment should be well grounded and the electrical connection permanently installed without extension cords or plugs.

**Towel services** are used by some establishments, usually stores and offices. For industrial use, individual towels kept in lockers may not be changed often enough and they may come in contact with soiled work clothes.

### Toilets

Toilets should be partitioned off from washrooms and lockers. Partitions of enameled metal are attractive in appearance and easy to keep clean. These partitions may be suspended from the ceiling or mounted on the walls.

Wall-mounted toilets make floor cleaning easier and quicker. The oval-rim type of toilet with open-front plastic seat is most widely used. Foot-operated flush valves are favored by many.

The flushing mechanism should be rugged since employees often kick the handle instead of operating it by hand. Flush valves should be equipped with vacuum breakers to avoid back siphonage.

Minimum number of toilets specified by *American Standard Code Z-4.1*:

No. persons	No. toilets
1- 9	1
10- 24	2
25- 49	3
50-100	5
Over 100	1 for each additional 30 persons

Toilets should be not more than 200 feet from any work place; preferably less than 150 feet.

Facilities for men and women should be plainly marked.

**Urinals** should be placed throughout the plant in convenient locations to avoid loss of time. One urinal for each 40 men is usually sufficient. Automatic flush valves use more



water but are more effective in maintaining cleanliness since many persons seem reluctant to touch hand-operated valves.

Floors of toilet rooms should be of impervious materials, smooth and free from cracks. Tile and concrete are satisfactory. Floor drains permit frequent flushing.

If possible, toilet rooms should have outside windows for light and ventilation. State or municipal regulations usually contain provisions for ventilation.

Switches for lights, electric driers or other equipment should be located so they cannot be operated by a person in contact with piping or other grounded conductor. In pull-chain fixtures the chain should be interrupted by an insulating link close to the fixture.

In plants where eating rooms are close to toilet rooms, covered receptacles for disposal of waste food should be provided in the lunch-rooms. Eating lunches in the toilet room should not be permitted.

Cuspidors should be provided where needed and cleaned at least daily. The disposable type requires less handling.

### Lockers

A well-equipped locker room is an aid to orderly habits and often to health.

Exposure to toxic substances calls for extra precautions to prevent dangerous materials being carried away on clothing. Separate lockers prevent contact between street and work clothes. They should preferably be in separate rooms with shower stalls between them.



" . . . . And where your bench used to be . . . . "

In such plants supervised washup periods and shower baths are important safeguards.

Sloping tops prevent the use of lockers for storage. Dust is conspicuous and easier to remove than with flat tops.

Built-in lockers extending to the ceiling avoid dust-catching surfaces.

Lockers should be at least four inches off the floor to permit flushing the floor without wetting the contents of the lockers.

Forced ventilation supplied through perforations in the bottom of the lockers or through louvers in the doors is helpful in removing odors. If the work is heavy or wet, circulation of heated air through the lockers is desirable.

Lockers in which oil-soaked clothing, waste, or newspapers are kept create a serious fire hazard. Lockers should have solid, fire-resisting sides and backs, but doors should have louvers for ventilation. Employees should not be permitted to leave clothing or rags saturated with oil or paint in lockers. Locker rooms should be fire-resistant, separated by fire walls from the main building.

Baskets and hangers on elevating chains are used instead of lockers in some industries, such as mines and foundries. Damp work clothing can be dried out between shifts and the drying is often hastened by steam coils at the ceiling. Such an arrangement conserves floor space.

### Rest Rooms

A rest room should be provided in all establishments where 10 or more women are employed. Where there are fewer women and a separate room is not available, suitable space, properly screened, should be provided.

For 10 women, minimum space is 60 square feet, with at least 2 square feet for each additional woman employee. For less than 100 women at least one bed or couch should be provided; for 100 to 250 workers, 2 beds, and 1 bed for each additional 250 workers.

### Washing Facilities

Max. No. Persons Using Facilities at One Time	No. Washing Facilities
15	1
30	2
50	3

For each additional 25 persons

1 additional

Note: Where circular fountains are used, 17 inches of outside rim equal one lavatory.

### EYE WASHING FOUNTAIN



SAVE EYES!

Leading industrial doctors advise immediate washing with plenty of running water as the best first aid treatment for any chemical in the eyes. Records prove that washing with water for ten minutes or more, close to the accident, is necessary to reduce or eliminate eye damage.

Forehead operation leaves hands free to open eyelids so water can be directed wherever chemicals might be lodged. Sanitary white baked enamel bowl is resistant to most fumes.

Over 500 industrial plant installations have been made to date.

Write For Details.

VALVE Chain Operated Quick Action Self-Closing

NEW EMERGENCY SHOWER



Deluge of Water 30 to 40 G.P.M.

The B & A Shower is the quickest and most satisfactory way to saturate a worker with gallons of water the instant an accident occurs, to prevent a disfiguring burn—even a fatality.

Special shower head, no holes to clog—can be used where unfiltered water prevails.

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GLASS SLIVERS AND CHEMICAL IN EYES!

DISFIGURING FACIAL CUTS AND BURNS!

CUTS AND CHEMICAL BURNS ON ARMS AND BODY!

THIS HAPPENS WHEN UNPROTECTED GLASS BOTTLES ARE DUMPED

NEW LOW COST B & A SAF-T-BAGS



5 PINT 1 GALLON 5 GALLON

are widely used for the safe handling of glass bottles containing harmful chemicals; also the storage and recovery of expensive serums, biologicals, and other costly products.

Painful cuts, disfiguring burns, loss of eyesight, or even a fatality, do result from corrosive liquid splash and flying glass when unprotected bottles shatter.

Write For Details.

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P. O. Box 7542, Dept. N.S., Chicago 80, Ill.

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# Liquid Soap

# Bar Soap

## EVERY TYPE OF SKIN CLEANSER

# Lightfoot

manufactures all three from raw material to finished product!

A Specialized Soap for Every  Type of Plant Requirement!

### POWDERED SOAPS

To meet every conceivable industrial need... for light, heavy or extra heavy duty, for general plant or office use, or to solve specific cleansing problems.

### CHOICE OF BAR SOAPS

- A hard milled soap, extremely economical, especially designed for industrial use.
- An extra mild soap for dry or sensitive skins.
- A hexachlorophene product for those departments requiring this type of soap.

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Furnishes profuse lather; will not irritate or dry the skin. Shipped in non-returnable containers.

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Because Lightfoot manufactures its basic soap from raw material to finished product, you have the assurance of constant, uninterrupted supply of uniform quality, plus a "price right" sales policy.

### PROMPT DELIVERIES

Stock warehouses in key cities fill orders immediately upon receipt.

### DEPENDABILITY

For more than 40 years, America's leading plants have accepted the name "Lightfoot" as a cleansing product as a symbol of efficiency and dependability.

### TECHNICAL COOPERATION

Lightfoot Advisory Service aids on cleansing problems of all kinds, and has saved substantial sums for many customers.

Your inquiries will receive prompt and intelligent attention

## LIGHTFOOT SCHULTZ COMPANY

380 MADISON AVENUE

NEW YORK 17, N. Y.



## ACE SALT TABLET DISPENSER

### NEW—DIFFERENT

### ECONOMICAL

### SANITARY 95% GLASS AND PLASTIC

### STRONG—SIMPLE

### FOOL-PROOF

The last word in salt tablet dispensers. Holds 750 10-grain tablets. Price \$2.50 each, Postpaid.

### ACE MANUFACTURING COMPANY

DIVISION OF  
AMERICAN DEVICE MFG. CO.  
STEELEVILLE, ILLINOIS

## Ventilation

—From page 62

or fiber glass treated with oil, have greater dust-holding capacity.

A filter should have:

1. Low initial resistance to air flow.
2. Reasonable length of service.
3. Efficiency under changes of temperature and humidity.
4. Low flammability.
5. Reasonable replacement cost or ease of cleaning.
6. Low maintenance cost.
7. Freedom from odors.

**Electrostatic precipitation.** This method is highly efficient, particularly for fine dusts which are difficult to remove by other methods. It offers low resistance to air flow. First cost and maintenance cost are relatively high.

Portable units, recently introduced, are helpful in removing dust and smoke from small rooms.

Precipitators have comparatively low efficiency in collecting large particles moving with considerable force. For high concentrations of dust they generally require pre-cleaners. They are valuable when the manufacturing process requires a practically dust-free atmosphere.

A combination of viscous filter and electrostatic precipitation with a self-cleaning feature on some models is available. It solves the problem of dust capacity and of heavy particles.

**Cyclones.** A cyclone consists of an outer cylinder fitted with an inverted cone-shaped hopper and an inner concentric cylinder which serves as a discharge duct. Air from the main duct of the exhaust system, under high velocity, enters the large chamber where the air is given a circular motion. The heavier particles are thrown to the outer wall by centrifugal force and fall along the wall. Air escapes through the top.

Cyclones are most effective for large particles, such as sawdust, shavings, heavy lint, etc. After passing through them, air cannot be returned to the workroom without further filtering. Cyclones are relatively inefficient for removing small particles.

**Dynamic separators** combine fan and collector in one unit. In form this type of separator is somewhat like a cyclone, but the centrifugal separating action is performed by the revolving blades. It is more efficient than the cyclone.

In some types water spray is introduced with the dust at the inlet. Wet collection increases efficiency for fine dusts.

**Wet collectors** use several devices for obtaining contact of water with the exhausted air so that dust particles form a sludge. One type consists of sprays or water curtains through which dust-laden air is drawn. These are efficient collectors for many types of dust. An important application is in the prevention of dust explosions from grinding aluminum or magnesium.

**Supersonic flocculation.** Suspended dust is passed through a field of supersonic vibrations, inaudible to the human ear, generated by a high-frequency siren. Vibration flocculates the fine particles, and the aggregates are then collected by cyclones or other measures for collecting relatively coarse particles.

#### General Safety Measures

**Personal protective equipment** is needed where exposure is occasional or where complete protection is not practicable. Removal of the hazard at its source should remain the objective.

**Sanitation and housekeeping** must receive constant attention. Otherwise  
—Turn page

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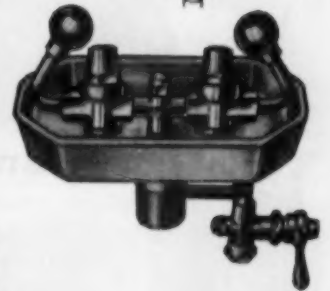


## HAWS EYE-WASH FOUNTAINS



Time elapsing between the accident and arrival of medical aid, is too often a cause of permanent eye injury. Bridge this time gap with a HAWS Emergency Eye-Wash Fountain. Installed at convenient locations, these HAWS safety devices are instantaneously ready when such accidents occur.

The HAWS Eye-Wash Fountain washes injurious chemicals out of the eyes with clean water at controlled pressure and volume. It is also available with Drench Shower Attachment...completing an emergency station for your employees' protection.

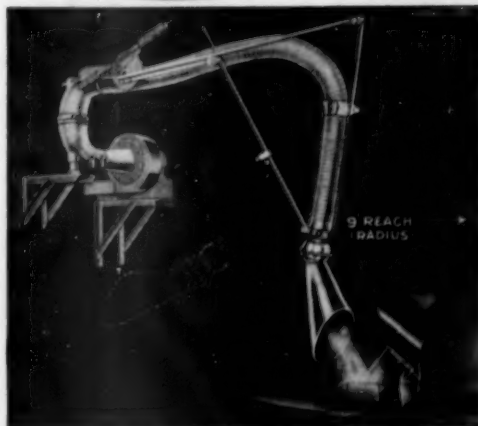


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leading safety engineers

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1439 FOURTH STREET (Since 1909) BERKELEY 10, CALIF.

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Ruemelin Fume Collector in operation.

Welding shops equipped with Ruemelin Fume Collectors are assured of a clean shop atmosphere. Noxious fumes, heat and smoke are eliminated at their source, thus improving working conditions, lessening fatigue and paving the way for increased plant production.

The Ruemelin Fume Collector hood can be instantly placed where needed anywhere in the booth welding area. No tedious adjustments necessary. Just pull the inlet hood to the welding position and you are ready to go.

Note the new spring-loaded counterbalance mechanism which makes Fume Collector much easier to handle. Ask for Bulletin 37-E illustrating this new feature.

**—RUEMELIN MFG. CO.—**

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SAND BLAST AND DUST COLLECTING EQUIPMENT  
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what *they do* means a lot to you



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Testing... testing... testing... that's the secret of the longer life and trouble-free operation you can expect from a Halsey Taylor Electric Cooler.

Here you see men testing, hour after hour, for capacity, for leakage, for accuracy of temperature and refrigerant controls, for correct setting of expansion valves... for every factor that can mean the difference between dependability and uncertainty!

That's why the Halsey Taylor nameplate is your guide to performance, no matter what type of cooler or fountain you buy!



THE HALSEY W. TAYLOR CO., WARREN, OHIO

R-41

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Give You  
All These  
Features!

**TOPS** Choice of Polished 14 Ga. Stainless Steel; Formica in all colors and designs; Caf-o-lite or Edge Grain Maple!

**SEATS** Choice of upholstered or hardwood seat, with back rest or seat only; cast iron seat in porcelain enamel colors; or Anodized aluminum seat.

**BASES** Lifetime Cast Construction in your choice of colorful enamel paint finishes. Units available in lengths to seat 4 to 24 people.

**Write Today for Free Catalog!**

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The Chicago Hardware Foundry Company

"Dependable Since 1897"

1035 Commonwealth Ave.  
NORTH CHICAGO, ILL.



equipment will lose its effectiveness and unhygienic conditions develop.

Supervision and training of employees, particularly in hazardous operations, is important. Workers exposed to toxic substances should receive frequent physical examinations.

Medical control is seldom successful as a primary method of control, but is an important check on other methods. Maintenance of engineering control is sometimes inadequate and symptoms of absorption of toxic materials by a worker may be the first real warning.

The safety department should be notified of the introduction of new materials and processes so that possible hazards may be assessed and safeguards provided.

### Air Conditioning for Hot Jobs

Operators of overhead traveling cranes are often subject to extreme heat and humidity, as well as to gases, vapors and dusts from operations below.

To improve conditions, cab coolers have been designed. These coolers are self-contained units which need only an electrical connection. They supply clean air, cooled and dehumidified to the cab.

Locomotive cranes, which often must operate in excessively hot locations, can be provided with similar equipment.

These units can also be used to heat the cab in cold weather.

For pulpits and other control locations in steel mills where heat, dirt or fumes create uncomfortable and hazardous conditions, similar equipment has been designed.

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## RODENT AND INSECT CONTROL

**RATS, MICE AND INSECTS** eat, destroy and spoil millions of dollars worth of food and other materials every year. These pests are also carriers of many diseases.

A balanced program of rodent control has three parts:

1. Sanitation—taking away food and shelter.
2. Ratproofing—building him out of places where he can get food and cover.
3. Reduction—by various methods of killing. Without the other two methods, reduction can be only temporary.

Rodents cannot exist without food, water and shelter. This makes good housekeeping vital for factory, home and farm—indoors and out.

Scraps from the kitchen and from employees' lunches should be placed in covered metal containers. Spilled grain or other edible materials should be swept up daily.

Ratproof construction helps to keep them out of a building. Hard concrete bricks and metals, of 24 gauge or heavier are effective. Hardware cloth screens should have not more than half-inch openings—for mice one-quarter inch.

Almost any material stored on the ground may provide shelter. The rodents will have difficulty getting established if the material is stored on racks 18 inches above the ground.

**Extermination.** Traps, gases and poisons are still the most effective methods of keeping down the rodent population. Their natural enemies, such as dogs, cats, ferrets, snakes and hawks are not dependable and some of them, obviously, are not desirable pets.

Many types of traps have been devised but the old wooden bait trap is still widely used.

**Poisons.** Red squill has long been a popular and effective rat killer. It acts as an emetic on other animals but rats and mice cannot vomit and death results.

Warfarin, one of the newer products, is also relatively harmless to most other animals and to human beings. It is used in establishments handling food products where more toxic substances could not be used safely.

More powerful poisons, such as thallium sulfate and sodium fluoroacetate (1080) should be avoided by amateurs.

Many other rodent killers introduced in recent years have been discarded because they had too many disadvantages.

**Fumigation.** Carbon monoxide can be used in outdoor places. A hose attached to an automobile exhaust is put down the burrow.

Chloropicrin, or tear gas, has the advantage of being repellant. A heavy application is said to make a burrow uninhabitable for several months.

Calcium cyanide can be applied to burrows with a foot pump. It is not recommended for use indoors where there may not be enough moisture to liberate cyanide, thus creating a delayed hazard. The gas is lighter than air and outdoors it rises rapidly and it has a strong warning odor.

Methyl bromide is an effective gas but its use is recommended only for professionals.

### Insecticides

Wherever food is grown or processed, a constant fight must be waged against insects. For farm and garden the traditional poisons such as lead arsenate, Paris green and nicotine sulphate have been supplemented by much safer products such as rotenone, pyrethrum, and DDT.

No insecticide, however, should be considered harmless. The user should avoid inhaling dust or spray of any kind and allowing any of it to remain on the skin. For extensive use, protective clothing and gloves and a respirator may be desirable.

Lethal fumigant gases are used for exterminating weevils, moths, beetles and other insects. Carbon disulfide has been used for controlling weevils in grain but it is highly toxic and highly flammable.

Fumigation should be done only by licensed fumigators.

### Handling Chemicals

Acids, alkalis and other corrosives require a variety of specialized handling apparatus as well as protective garments for employees. Devices include buckets, dippers, funnels, pitchers, pumps and carboy inclinators.

Bags for carrying bottles of corrosive liquids lessen the risk of accidental breakage. The bag is of padded impermeable, acid-resistant material. Containers for bottles are available commercially.

Materials used for equipment include rubber, neoprene, stainless steel, and certain types of plastic. These materials are of many types which differ quite widely in resistance to corrosives.

## SPEAKMAN LIFE-SAVER EMERGENCY SHOWERS

FOR A

### Drenching, Sloshing Deluge of Water

The moment an accident victim steps under a Speakman Emergency Shower, he is deluged with a flood that in a split-second douses flames or washes chemicals from the body instead of driving them into the skin.



- No holes to clog
- Withstands years of hard wear
- Slow, self-closing valve
- Flow up to 52 gal. per min.

#### Models available:

- S-2075—regularly furnished with chain to floor and floor flange
- S-2075—modified with short chain and 8" diameter pull ring
- S-2075—modified for horizontal installations
- S-2080—free-standing frost-proof unit for outside installation
- S-2085—with shower outside and valve inside the building
- S-2090—platform operated unit

For more information about Speakman LIFE-SAVER Emergency Showers, write for Booklet S-75.

**SPEAKMAN COMPANY**  
Wilmington 99, Delaware

# TORIT UNITIZED DUST CONTROL

*eliminates  
dust  
at its  
source!*



**TORIT UNITIZED DUST CONTROL** means each machine has its own custom-tailored dust collector designed to work specifically for that machine. There is no guess work, or average suction. Furthermore, dust control is provided only when that machine is running . . . there is no waste of power such as you have with centralized control when only a few machines are operating. This means better dust control at lesser operating cost and less initial installation cost. Get the facts now on how Torit will work better to . . .

**"CLEAR THE AIR".**

See our catalog in  
Sweet's Machine Tool File, or write:

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291 WALNUT STREET  
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## FOOD SERVICE

**INDUSTRIAL FOOD SERVICE** has become a big business. While the large companies have been operating plant cafeterias and lunchrooms for many years more and more smaller concerns have been providing food service on a limited scale.

In-plant feeding, originally planned to provide a substantial meal in the middle of the shift, now includes morning and afternoon "coffee breaks" which have been found helpful in avoiding fatigue.

Two important developments have been helpful in making food service practicable for smaller concerns:

1. **Vending machines.** These now dispense anything that can be packaged, including cold and hot drinks.

2. **Disposable paper utensils** which eliminate dishwashing and breakage and maintaining a staff of employees. These utensils meet all hygienic requirements.

### Types of Service

Food services for industry are of four main types:

1. Cafeterias preparing and serving hot meals.
2. Canteens or lunchrooms dispensing sandwiches and other packaged foods and hot and cold beverages. A few hot dishes may be served.
3. Mobile canteens which circulate through the plant.
4. Box lunch services.

**Management.** In larger plants, food service may be operated by the company, often at a loss. Deficits are regarded as an investment in employee good will.

In smaller establishments the more common practice is to engage an industrial caterer. Foods are prepared in a central kitchen and transported to the plant in vacuum containers, although coffee may be prepared on the spot. The company provides the quarters, with dishwashing facilities. It avoids the investment in kitchen space and equipment and maintaining the necessary staff.

Vacuum insulated containers are also used in large plants which cover large areas and prepare food for scattered lunchrooms in a central kitchen.

Whether operated by the company or by a concessionaire, constant supervision is desirable to maintain standards of quality and sanitation.

**Location.** Convenience for employees and efficiency of supply and operation are points which often

decide the location of the lunchroom. In many plants the lunch hour has been shortened to allow employees to leave earlier and quick service is important.

Wholesome and palatable food eaten in clean, pleasant surroundings has both physical and psychological benefits. Lighting and ventilation of the lunchroom should receive careful attention.

Lunchrooms are often used for safety meetings and other gatherings for business or pleasure.

Canteens offer less elaborate menus than cafeterias, but investment in equipment and operating costs are considerably lower.

Where only limited quarters are available for lunchrooms, a schedule of staggered lunch hours for different departments may be arranged.

Workers who bring lunches from home and those who patronize box lunch services should have a clean place to eat. Eating in the work places is permissible when operations do not create any health hazard. Locker rooms may be used if clean and well ventilated.

Drinking water should be provided in all rooms assigned for eating purposes.

### Sanitation

Strict cleanliness in the kitchen is most important. Patrons who get a glimpse of the kitchen should be reassured by what they see.

All perishable food and beverages should be kept under refrigeration except when being prepared or served.

Preemployment and periodic physical examinations for employees are important health measures.

**Dishwashing.** From the hygienic standpoint, dishwashing by machines is much preferable to the hand method. Where large volumes of utensils must be washed they are more economical. Modern machines are efficient and easy to keep clean. Most models have devices to maintain—*Turn page*

### SPACE FOR LUNCHROOMS

Max. no. persons at one time	Square feet per person
Less than 25	8
25 to 74	7
75 to 149	6
150 to 500	5
More than 500	4

# \* Automatically!

## Sani-Dri Electric Dryers

**\* eliminate  
needless towel costs!**

(No more buying and storing of towels)

**\* save  
maintenance overhead!**

(24-hour service—no waste to empty)

**\* clean-up  
littered washrooms!**

(More sanitary! No fire hazard!)



No. 7-A Model. See catalog for recessed foot switch and other models

### Even With Just 1 Washroom— You Can Save, Too!

Savings are automatic with Sani-Dri! You eliminate 85% of washroom maintenance overhead PLUS 100% savings in towel costs. In addition, you get 'round-the-clock automatic drying service with greatly increased sanitation. Investigate this modern trend to low cost automatic drying now!



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Get the savings facts about Sani-Dri, the original and only complete line of dryers sold throughout the world. All models carry Underwriters' Seal and full 2-year guarantee. Write today!

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"Dependable Since 1897"

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## Food Service

—From page 82

tain the temperature of wash and rinse water.

A bactericidal rinse after washing is required by most codes. This can be done by immersion in water of at least 170 degrees for two minutes or longer. A chlorine solution of 100 parts per million is effective.

Clean dishes can also be obtained by hand washing. Requisites are a two or three-compartment sink, provision for scrapping dishes and disposing of garbage, adequate water-heating facilities, and effective detergent and competent supervision. Baskets for utensils make it possible to use hotter water than hands could endure.

Drying with towels, while not expressly prohibited, is not recommended.

Helpful information for planning and operating food service facilities is often obtainable from local and state health departments and from publications of the U. S. Public Health Service.

**Vending machines.** Conveniently located coin-operated vending machines provide such items as cookies, candy bars, sandwiches and soft drinks. Some machines dispense hamburgers, frankfurters and coffee heated by electronic devices. Machines should incorporate recommended principles of sanitary design.

Beverages are dispensed either in bottles or in paper cups. The latter method avoids the problem of lost and broken bottles.

Plastic cups, plates and tumblers reduce the cost and hazard of breakage. Some types withstand the high temperatures of dishwashing machines.

**Paper utensils** for both hot and cold foods and drinks are popular for smaller lunchrooms and canteens and for restaurants handling take-out orders. They avoid the health hazard of poor dishwashing and loss through breakage.

Receptacles should be provided for disposal of used utensils.

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## STOP ATHLETE'S FOOT...



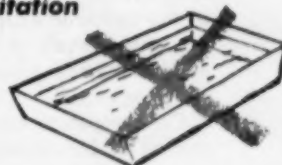
with

**SANI-  
MIST**

## DON'T SPREAD IT

with old fashioned  
methods of foot

sanitation



**SANI-MIST** eliminates: Foot baths; Foot pads; Messy floors; Contamination; Dilution; Re-use of solution. The SANI-MISTER dispenses an individual full strength treatment that kills the principal fungi causing Athlete's Foot in less than 30 seconds.

Preferred by schools, clubs and industries from coast to coast. Send coupon now for full details.

Gentlemen:

Please send complete details of the safe, clean SANI-MIST method of Athlete's Foot prevention.

Name.....Title.....

Company.....

Address.....

City.....Zone...State....

**SANI-MIST INC.**

1724 Chestnut Street, Phila. 3, Pa.

# NOISE CONTROL

**A**LTHOUGH noise control is a branch of industrial health engineering, its growing importance to industry and to the public merits special discussion here. Few topics are of greater current interest, and a vast amount of material has been published.

Noise is one of the undesirable by-products of civilization. While no man-made noise has yet equalled that of the volcanic eruption of Krakatoa in the East Indies, the sound levels to which millions of people are exposed on and off the job are much higher than they were 50 years ago.

Compensation for loss of hearing due to occupational causes is increasing but that is only part of the cost of noise. Fatigue, with resulting inefficiency and increased susceptibility to accident, and depreciation of property values are also heavy items in the nation's annual noise bill.

The problem is a complex one and the solutions are often expensive. Nevertheless they must be found if progress is not to be retarded by its own noise.

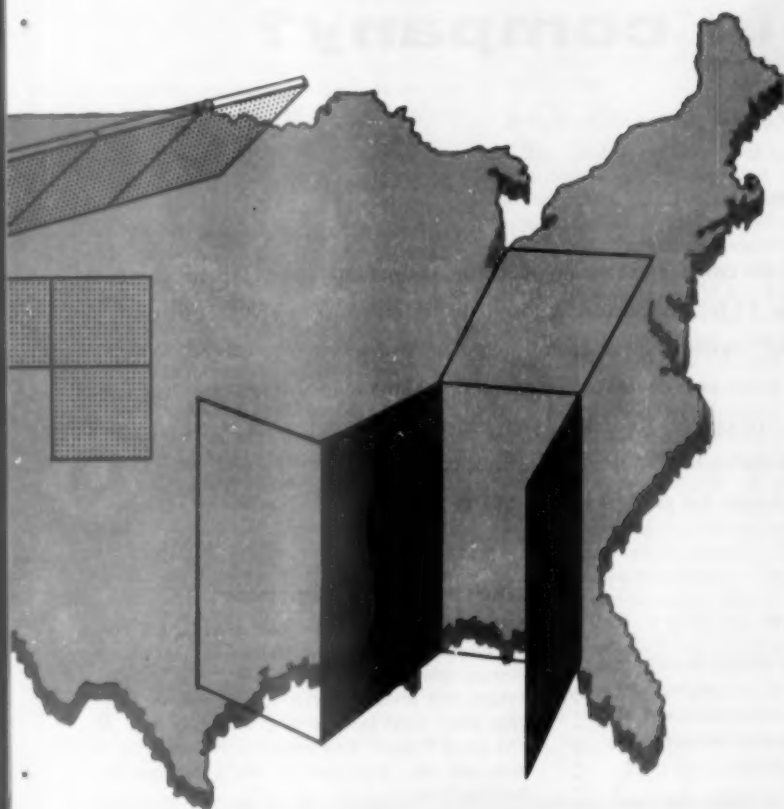
There are two principal methods for control of noise—engineering and medical. The first deals with methods of muffling noise; the second, while concerned with sound-proofing methods, deals primarily with the protection of the individual who must work in an unfavorable environment.





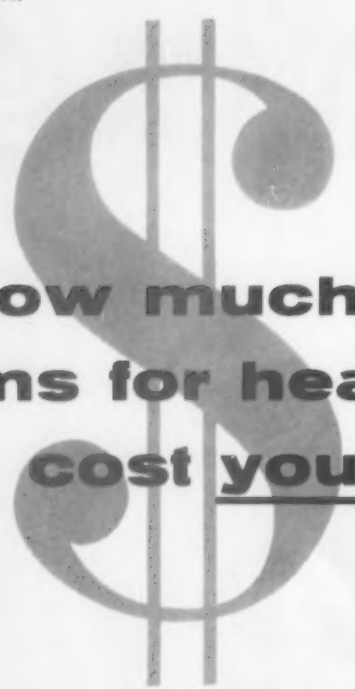
# NOISE CONTROL

4



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# how much could claims for hearing loss cost your company?

A flood of claims against companies by employees for occupational damage to hearing may now total over \$2 billion, according to reliable estimates ☆ ☆ The fact that no such claims may have been filed against your company yet does not guarantee you will not be subject to them in the future ☆ ☆ Laws of 45 states already make accidental or traumatic loss of hearing compensable. About half of these states recognize gradual loss of hearing as an industrial disease. Even if you are located in a state which does not have these laws, your company may be subject to damage suits for gradual loss of hearing.

## how can you protect yourself?

A number of far-sighted companies include audiometric tests of hearing as part of pre-employment physical examinations. These give an accurate record of employees' hearing and may protect you against future claims for hearing loss that do not result from conditions in your plant.

These companies also test the hearing of their employees periodically. If your plant uses noisy equipment that can damage hearing, it may save you many dollars to give your employees periodic audiometric tests of hearing.

## take the first step now!

Beltone Hearing Aid Co. has developed a new one electronic tube circuit Audiometer that makes hearing tests easy and accurate. It is a lightweight, low-priced, trouble-free instrument that your plant nurse can use to give hearing tests. If you get a Beltone Audiometer and start using it now, you may save yourself costly damages for hearing loss.

## Free booklet

Send today for illustrated booklet that explains the new Beltone Audiometer. There is no cost or obligation.

**new**

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A precision testing instrument made by

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# NOISE CONTROL

**NOISE** may be defined as "unwanted" sound.

The components of noise are: (1) Intensity or loudness; (2) Frequency or pitch; (3) Quality or timbre.

## Measurement of Noise

**1. Intensity or loudness.** Intensity or loudness of noise is measured by a sound level meter, more commonly called a noise meter. It consists of a microphone, an amplifier, a calibrated attenuator, three frequency response characteristics controlled by three taps and an indicating meter.

The unit of sound measurement is the "bel," or more conveniently the "decibel," which is one-tenth of a bel, named in honor of Alexander Graham Bell. A level of zero decibels represents roughly the weakest sound which can be heard by a person with very good hearing.

Noise levels produced by familiar sources of sound are shown in Table I.

## 2. Frequency and quality.

The sound level meter measures only weighted or unweighted sound pressure. For a more complete description of sound, measurements must involve frequency and quality or timbre.

Different types of noise have different effects on the hearing mechanism. Noise of high intensity is believed to be more injurious to the hearing when it is of high frequency than when the frequency is lower. A locomotive whistle, for example, produces a sound of low frequency,

while an air hose produces a sound of high frequency.

Two sounds of the same intensity and the same pitch may vary appreciably in the annoyance they cause because of the different harmonic makeup or quality.

To obtain information on the distribution of sound pressure as a function of frequency, measurements are made with a sound level analyzer. Depending on the use to which data will be put, the engineer may select one of several types of analyzers.

## Levels of Injurious Noise

The limits for injurious noise are still vague and uncertain and the entire noise problem requires additional research and evaluation.

Some authorities agree that damage to hearing is likely to occur at noise levels above 90 decibels. It is necessary to start at some level and 90 decibels has been selected as a level at which one should become concerned about noise.

Other factors which must be considered besides the actual intensity of the noise are the total length of exposure, the length of exposure period, whether the sound stimuli are continuous or interrupted, the length of interruptions, type and space of environment with reference to reverberation, age of worker, and presence of previous trouble.

It is recommended that the various plant operations be tested with an approved sound meter, and that a record of the noise level be compiled by departments. This state-



Portable audiometric testing room. It is mounted on vibration isolators and has walls, ceilings and floors of acoustically treated panels. (Industrial Sound Control, Inc.)

ment refers to the noise level which is more or less continuously present, and not the occasional high intensity noise.

In the absence of a sound level meter, an approximate idea of the noise intensity may be obtained as follows: Walk through the plant with another person having normal hearing and try to carry on a conversation. If shouting is necessary, the sound level is usually higher than 90 decibels.

## Methods of Control

Remedies for the noise problem fall into two classes: (1) Engineering control; (2) Medical control.

### 1. Engineering Control

Methods for reducing the noise level may be classified as follows:

**1. Control of Noise at Source.** The most fundamental attack on noise hazards is removal at the source. With good engineering design much noise can be eliminated, as is evidenced by comparison for noise of a new streetcar or subway with the older ones. Also, most home appliances have been greatly quieted in recent years by proper design.

Much unnecessary noise results from worn and improperly maintained machines. It is important, therefore, that machines be kept in good operating condition.

**2. Substitution.** Another method of noise control is to substitute a less noisy operation, if possible. Spot, arc or flame welding may be substituted for riveting in some operations.



Sound absorbers hung by wires from ceilings may be used where ordinary acoustical treatment cannot be applied. (Sonosorber Corp.)

While application of this method may be limited, nevertheless it should be considered.

**3. Isolation.** Frequently noise can be isolated so that its disturbing effect will be encountered by fewer people. A noisy machine may be removed from a room containing many people and placed elsewhere so as to expose only the employees necessary for the job. Well-insulated partitions and tightly-closing doors should always be provided between a noisy room and adjoining areas.

**4. Resilient Mountings.** If heavy machines are firmly bolted to concrete or wood floors, it frequently transforms the floors into huge sounding boards. These not only amplify the original noise volume but help to spread the noise throughout the entire building. Rubber or other resilient mountings will usually reduce both the vibration and noise. Resilient floor coverings further reduce the noise level.

**5. Sound-absorptive materials.** Sound-absorptive materials are extremely useful for controlling noise in buildings. Hard surfaces, such as plaster and brick walls, reflect sound and cause reverberation. Sounds coming from all directions, as well as those coming from long distances, apparently undiminished, are very annoying.

The solution is the absorption of high frequency sounds by the application of acoustical materials. This consists of applying sound absorbents to ceilings and walls in the form of acoustical tiles, acoustical plasters, sprayed-on compositions, and blankets which have been prefabricated from porous material such as glass wool.

The problem of sound control by acoustical treatment is far from simple and help should be sought from experts in that field.

**6. Reduction of Noise at the Ear by Protective Devices.** There are situations where even thorough sound control may leave the noise



Scaffolding for installing acoustical form board on 60 foot ceiling of Canton, O., Memorial Auditorium. (Patent Scaffolding Co. and Owens-Corning Fiberglas Corp.)

level too high due to the nature of the industrial operation, as in the testing of jet engines. In such instances operators should be protected with properly designed and fitted ear defenders which will reduce the intensity of the sound reaching the hearing mechanism. This is as necessary for the protection of the ears as is the use of safety goggles for the protection of the eyes.

Four types of ear defenders are now commercially available:

**1. Substance molded by the user.** This type of ear plug consists of pliable balls of wax and cotton, and are molded by the user to fit his ears.

**2. Molded Plugs.** This type of ear defender consists of molded plugs of neoprene or vinyl plastic or rubber, which are inserted into the ear canal.

**3. Muff Types.** There are two designs of the muff-type ear defender. One consists of a spring headband to which is attached a pair of muffs constructed of plastic and sponge rubber, which fit over the ears. The other type consists of a spring headband to which are attached a pair of soft pliable plugs which fit inside the ear canals. The plugs are fabricated before insertion in the ears.

**4. Ear Valves.** This type of protector is an ear filter made of non-corrosive metal and neoprene or soft plastic. When placed in the ear canal, the valve admits conversational tones but automatically closes and protects the inner ear from pressure caused by sudden loud noises or the concussion of explo-

sions. It is more expensive than the simpler ear plug.

The amount of protection offered by good ear defenders varies somewhat with design, and may be considered to be in the range of 25 to 30 decibels.

Under conditions of extreme noise a combination of both the ear plug and muff may be worn, which gives superior protection to either device when used alone.

## II. Medical Control

Where processes are on the noisy side, engineering control methods should be supplemented by a program of medical supervision. It is desirable to have a record of each employee's hearing, with periodic tests to detect possible deterioration.

The audiometer is the most standardized method of testing hearing loss. This is an instrument which produces tones of the purity and intensity required. One pure tone at a time is presented by headphone to the person under the test. The weakest intensity which he can hear is then found.

The difference in decibels between that intensity at which a person with

TABLE I

Source of Sound	Decibels
Zero Reference	0
Whisper	20
Low Street Noise	40
Conversation	60
Heavy Traffic	80
Critical Level	90
Subway	100
Airplane	120
Jet Engine	140

TABLE II

Source of Noise	Range in Decibels
Spinners, looms, lathes	80-95
Screw machines, punch presses, riveters, cut-off saws	90-95
Planers, routers, sheet metal, speed hammers	110-115
Drop hammers, chipping hammers	110-125



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## MACHINERY ENCLOSURES

ISC Machinery Enclosures (shown above) isolate the ear-splitting noise of metal shears, headers, punch presses and other heavy machinery.

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SERVICE

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Plant noise is more than a nuisance. It's a menace that lowers production, increases worker fatigue, raises accident rates and gives rise to deafness claims.

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Industrial Sound Control "Silence Service" products are designed specifically to accomplish this vital function. They provide the high degree of noise attenuation necessary to reduce worker fatigue, increase production, lower accident rates and eliminate danger of deafness claims.

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CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



Muff type ear protector, headband style. A helmet type for cold weather use outdoors is also available. (David Clark Company)

normal hearing can just hear that tone is the measure of hearing loss of the person. Another frequency is then selected and the test repeated.

A standard technique is followed. A graph known as an audiogram is then plotted. Hearing loss in decibels is plotted on the vertical ordinate against the log frequency on the horizontal ordinate. This gives a quick, accurate picture of the person's hearing acuity in the audible range.

Audiometer tests may be made by trained non-medical personnel. The hearing program, however, should be supervised by a physician.

Routine audiometer tests at regular intervals are advisable in addition to the pre-employment tests.

### Hearing Aids

Persons with varying degrees of hearing impairment can work safely and efficiently in many jobs. In other occupations, however, deafness may be a handicap or even a hazard to the individual and his fellow workers. Using the skills of the deaf is an important phase of vocational rehabilitation.



Ear valves are one of the more recent developments in ear protection. Sigma Engineering Co.]

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The Relation of Hearing Loss to Exposure—Z24-X-2.

In this rehabilitation program hearing aids are often of value. Properly fitted, they have enabled many persons to fill important jobs and live normal lives. Hearing aids require periodic servicing.

A list of hearing aids meeting essential requirements is maintained by the American Medical Association. Helpful information will also be found in National Bureau of Standards Circular 516, *Selection of Hearing Aids*.



Sound-level meter. (General Radio Co.)

Helpful information has been compiled in the Manual of Operation for an Industrial Hearing Conservation Program issued by the Committee on Conservation of Hearing, American Academy of Ophthalmology and Otolaryngology, 1136 West Sixth Street, Los Angeles.

### Planning the Plant

—From page 18

ing locations often bring transportation problems, particularly where transit service is inadequate. Employee car pools have become a recognized method of transportation. Some companies operate private buses, either free or at a low fare.

The working day really begins when the employee leaves home for the day's work and ends when he returns home at the end of the shift. Tardiness and absenteeism increase when getting to and from work is difficult. Management is also concerned about traffic hazards en route.

The effect of a new plant on traffic and parking conditions should also be considered. Many an industry otherwise unobjectionable as a neighbor may be unwelcome because of the congestion and hazard created.

**Topography.** Ground may be high or low, level or sloping, dry, swampy, or undermined. All of these factors must be considered in the plants. Normal drainage and the possibility of floods or washouts during heavy rains must also be considered.

On ground likely to be flooded, multi-story buildings have advantages. Upper floors provide a safe place to which valuable equipment and products may be moved.

**Waste disposal.** Waste and sanitary sewer location is determined chiefly by location of buildings, lay of the land, and maintenance needs. Sufficient manholes or other openings for maintenance should be planned.

Sewers should not be located where leakage might contaminate drinking water sources. In some instances it may be necessary to treat waste material before running it into streams or otherwise disposing of it. In other instances it may be necessary to install special sewerage systems. Federal as well as state and municipal laws may govern waste disposal.

**Climate.** In colder regions there are problems of ice and snow removal. Keeping the plant warm and free from air contaminants may make ventilation complicated and expensive.

In warmer and drier climates some material may be stored outdoors; in others, covered storage may be necessary.

Roof loads of ice and snow and strong winds also affect building design. Where storms of hurricane intensity are frequent, roof anchorage is important. Insurance companies have useful data regarding losses through windstorms and lightning in various sections of the country.

Prevailing winds also affect design and location of smokestacks.

—To page 93

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"Specialists in Noise & Pulsation Control"



## Planning the Plant

—From page 90

Protective lighting safeguards life and property, particularly in times of emergency. Fences high enough and strong enough to deter trespassers are also important in plant protection.

**Entering and leaving the plant.** Separate entrances and exits should be provided for pedestrians, vehicular traffic and railroad traffic. Entrance and exit gates should be not less than 35 feet from property line structures which might obscure vision. Gates for vehicular traffic should be arranged so that drivers will have a clear view of cross traffic when leaving the premises.

Passenger loading and unloading facilities should be arranged to avoid traffic hazards and reduce the time and physical effort required to reach the plant. If the plant is on a main highway, space should be provided where buses can at least pull off to the side for loading and unloading.

Where highway traffic is heavy and a large number of employees must be handled, an underpass or overpass will avoid congestion and delay in getting to and from the plant.

Some companies bring buses right into the plant. The buses are driven down a ramp to a central location. From there employees reach their jobs through passages below the main production floor.

**Parking.** The parking lot is an indispensable part of today's plant. It should receive consideration in all plans. If it is necessary to cross a busy thoroughfare to reach it, an underpass or bridge may be needed. Separate entrance and exit facilities should be provided.

Guides and marking aid in proper use of the parking area.

### Building Trends

High construction costs are stimulating the search for economical materials and methods. Newer building materials, which meet severe performance tests, are sometimes barred by local building codes. Work on standardization of building codes is being conducted by the American Standards Association and other organizations.

**One-story plants** are preferred in many locations where land values are not excessive and there is plenty of room for expansion. Advantages

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claimed for one-story construction are:

1. Lower construction costs.
2. Freedom from stairs and elevators.
3. Ease in routing and handling heavy and bulky equipment.
4. Better lighting and ventilation.
5. Ease in isolating hazards.
6. Efficient handling of material.
7. Ease of supervision.
8. Lower operating and maintenance costs.
9. Better possibilities for landscaping—an asset where the plant is in a conspicuous position near a main highway or an airport.

**Roofs.** Keeping the roof flat, or with few projections, reduces construction costs. Monitor and saw-tooth constructions are becoming less popular although they are effective in admitting natural light to the center of the building. With modern light sources simulating natural light, daylight has become less important.

### Materials Handling

General facilities for moving materials in and out of the plant are railroads, highways, water, and sometimes air. An occasional industry may use all four types of

transportation but more than two are seldom needed.

Loading docks should be planned for traffic both outside and within the plant.

Studies of flow of materials through the plant, from the time they are received, through processing, until they are shipped out as finished products, often reveals ways to eliminate unnecessary handling as well as hazards.

Adequate clearances between vehicles and fixed structures must be provided. This is particularly important in laying out plant railways and driveways.

### Machine Layout

**Space.** Machines should be located so that each operator will be able to move to, sit at, stand at, and move safely about his machine, bench, conveyor, hopper, desk, or other equipment where he works.

He must be able to get into that space without slipping, bumping objects, striking overhead objects, or coming into contact with live electrical parts, or moving parts of machinery.

—To page 187

# PERSONAL PROTECTION—PART I

**P**ROGRESSIVE MANAGEMENT does not expect employees to work without means of protection. Ideally, this means the elimination of all hazards at the source. In a more practical sense, it includes the provision of necessary items of personal protection for hazards which engineering or economic considerations have not been able to eradicate, for brief temporary exposures, and for emergency use.

Because of its size and scope, the section on Personal Protection has been divided into two parts. Part 1 deals with protection for the eyes, head and respiratory organs, which are covered in Handbook No. 24 of the National Bureau of Standards.

There is scarcely a company which has not on record numerous cases where goggles, face shields and hard hats have prevented serious and crippling injuries. Such stories appear frequently in employee publications.

Respirators, gas masks and other respiratory equipment provide protection against hazards which are just as and more insidious than flying or falling objects. It is not so easy to prepare case histories of types of equipment which offer protection against the less dramatic mishaps.

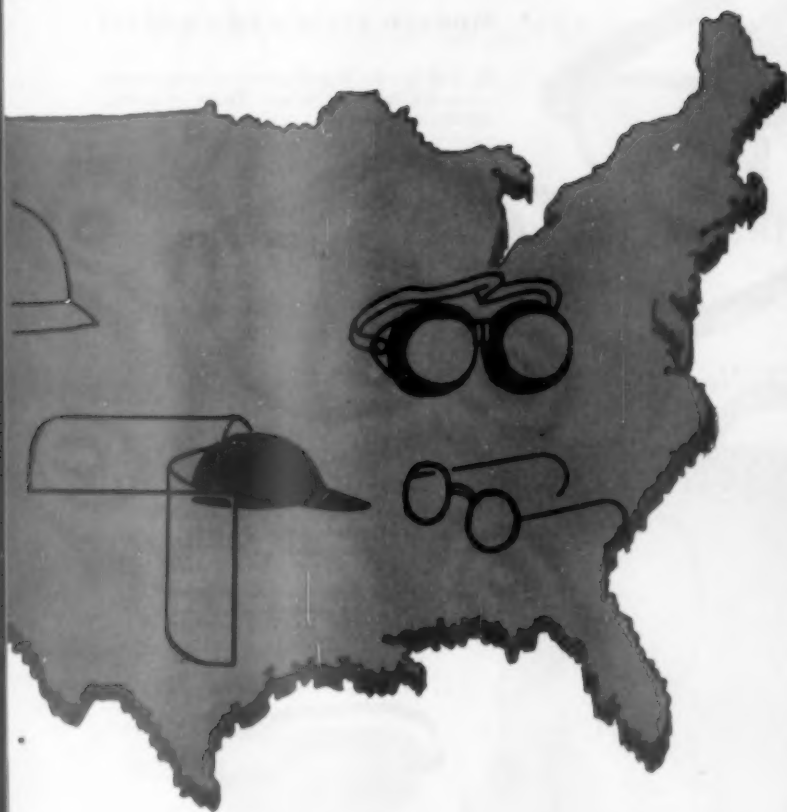
Surveys in recent years have shown the need for these types of equipment. Eye injuries account for some 4 per cent of the injuries and 3 per cent of the total compensation. The extent to which industry has been sold on eye protection has kept the percentage at a comparatively low figure.

Head injuries (other than eyes) constituted 6 per cent of the total number of injuries and 9 per cent of the total compensation.



**PERSONAL  
PROTECTION  
Part 1**

**5**



**IN THIS SECTION**

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<b>Respiratory Protection</b> . . . .	<b>106</b>
<b>Head Protection</b> . . . . .	<b>112</b>

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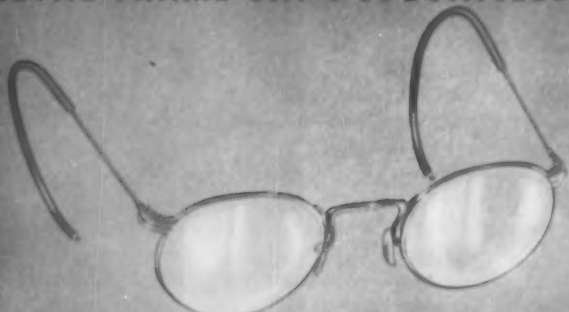
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USSSCO Safety Equipment meets all applicable Federal specifications or A.S.A. Code requirements.

# EYE CONSERVATION

**A COMPLETE PROGRAM** of eye conservation includes both protection against injury and correction of visual defects which reduce efficiency and increase liability to accident.

**Visual surveys.** For pre-employment examinations and periodic reexaminations it is important to determine the visual status of the individual. Several devices now on the market are satisfactory for this purpose. The manufacturers of this apparatus have prepared systems which use the data obtained from these tests to determine the employees visual fitness for various occupations.

These tests may be given by trained laymen. Their purpose is to find defects, not to prescribe corrective measures. Those needing corrective lenses are referred to refractionists (ophthalmologists or optometrists) to be fitted with glasses.

## Types of Protection

For protecting eyes and face against flying objects, dust vapors,

splashes of corrosive materials, and harmful rays, the following general types of equipment are used:

1. Goggles (safety glasses)
2. Face shields
3. Welding masks and helmets
4. Acid hoods

For detailed list and descriptions of various items of equipment for eye, head and respiratory protection, see accompanying definitions from *National Bureau of Standards Handbook H24*.

**Corrective lenses.** For visual defects, the wearer may have the correction ground in heat-treated lenses, or cover goggles may be worn over spectacles.

For optical reasons as well as convenience, corrective goggles are preferred. Most prescriptions can be ground in impact-resisting glass. The safety glasses will, of course, be heavier than ordinary spectacles.

In prescribing corrective lenses for goggles or for ordinary spectacles, the refractionist should be familiar with the job. It is particularly im-

portant to know the distance of the work level from the eye.

**Cover goggles** are often preferred where the correction is complicated and expensive lenses would be subject to pitting on the job. They also have advantages where a near-sighted person requires deep minus lenses. These might be excessively thick at the edges yet too thin for adequate protection at the center.

Familiar types of cover goggles are the cup type with heat-treated glass lenses and the wide-vision type with plastic lenses.

## Types of Goggles

Safety glasses are available in many types for practically every occupation. The protective medium may be heat-treated glass, transparent plastic, wire screen, or light-filtering glass.

Heat-treated lenses in spectacle frames, or cup goggles offer basic protection. The nature of the job and its eye hazards determine the specifications.

**Spectacle goggles** are worn for light or moderately heavy work, such as grinding, machine work and assembling where working positions are not too close.

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TYPES OF EXPOSURE  (National Bureau of Standards Handbook H24)	TYPES OF PROTECTION								
	CUP GOOGLES	SPECTACLES	SIDE SHIELDS	PLASTIC EYE SHIELD	PLASTIC FACE SHIELD	WIRE SCREEN SHIELD	FILTER GOOGLES	BUBBER GOOGLES	HOODS HELMETS
Heavy impact, large particles—Chipping, calking, some riveting operations, sledging in quarries.	X		X						
Moderate impact, protection from dust and small flying particles—Scaling and grinding metals, stone dressing where quartz is not involved, some woodworking operations.		X	X	X	X				
Metal sparks and spatter—Electric spot and butt welding where there is no exposure to excessive energy or excessive glare.			X	X	X				
Splashing metal—babbitting, pouring lead joints for pipes, casting hot metal, dipping in hot metal baths.	X			X	X	X			
Splashing liquids—Handling acids and caustics, dipping in galvanized tanks, some japanning operations.	X				X			X	X
Reflected light and glare—Long exposure to light reflected from snow, water, roads, etc.; incidental glare from furnaces, working near acetylene welding, etc.	X	X	X				X		
Injurious radiant energy—moderate reduction in visible radiant energy—Oxyacetylene welding and cutting.	X								
Injurious radiant energy—Large reduction of visible radiant energy.									X

our partner in business . . .

## THE SAFETY ENGINEER

Out in the field in sub-zero weather, high on the sun blistered girders of a half-finished bridge, everywhere safety engineers are testing, checking, teaching . . . preventing life-stealing accidents before they happen. These men, whose experience on the industrial firing line is carefully evaluated and recorded by our field representatives, help Bullard engineers and technicians plan and devise safer ways for industry. Our hard hats are off to safety engineers—the lifeguards of industry—our partners in the business of saving lives. E. D. Bullard Co., 275 Eighth St., San Francisco.

Write for full color prints of this painting, suitable for framing, without advertising message.

# BULLARD



**Q:**

What about building felt hat comfort into hats and caps that meet all standard industrial tests?



**A:**

We'll go you one further. This year's Bullard glass fiber hat and cap surpass industrial tests and are more comfortable to wear than that old felt hat. Exceedingly light in weight, they are cooler inside in the hot sun, because fiber glass deflects the sun and acts as an insulator. And for cool weather comfort there is a wide selection of winter liners. Hats and caps available in choice of molded-in colors. Also in colorful fiber glass we have electrical hats and caps and firemen's hats.

**Q:** Can we get color in aluminum hats to identify the trades of men on our crews?

**A:**

Yes, at no extra cost, in bright non-fading yellow-gold, blue, grey, green, bronze and standard silver. Bullard aluminum hats and caps meet the same rugged torture tests as our glass fiber hats. The "Shorty" model is one of the lightest (only 10 ozs.), and most comfortable safety caps made. Notice the flared brim that protects the head, neck and ears.



## For your questions—ANSWERS THAT SAVE LIVES!

This is what we mean when we call safety directors "our partners in business". Questions like these are referred to our research and development department. Here many of them are incorporated into Bullard products, so they will better protect your men in the field. Write for our new catalog with specifications and technical data on Bullard safety equipment.



# BULLARD

E. D. BULLARD COMPANY • 275 Eighth St., San Francisco, California

**Q:**

There hasn't been a change in the design of miner's caps in years... what can you do about it?



**A:**

First we made our miner's cap from tough resilient glass fiber. We made it so tough that after the consistent dropping of an eight pound ball from five feet, there was no damaging effect. We put a rolled edge all the way around the cap to keep the wearer's ears and neck from being nicked and also to hold side wire lamp cords. Across the top we put a deep groove that offers added girder-like strength, as well as securing an overhead lamp cord.

## Safety hat accessories most wanted by safety engineers!



Universal size headband that can be adjusted in seconds. Entire hammock and band easily snap out for replacement.

Chin straps of heavy elastic or web are available to fit all styles of Bullard safety hats and caps. They can be quickly installed.



Face shields in both clip-on (illustration) and swing-back types are specially made to fit all safety hats and safety caps.

Bullard has designed six types of winter liners to provide comfort and warmth to wearers of hard hats.





# HERE IS YOUR NEAREST BULLARD Distributor:



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ARIZONA, Phoenix Garrett Supply Company  
126 West Madison Street Phone: 3-6104  
COLORADO, Denver Goodall Rubber Company  
1033 Santa Fe Drive Phone: KE. 5800  
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Corp. P. O. Box 6004 Phone: LO. 2-8472  
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P. O. Box 2454 Phone: 6-4513  
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Hawkins Company Phone: 519-M  
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Co. 491-493 Prospect St. Phone: OR.2-7854  
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Prod. Co. 2820 N. 4th St. Phone: NE. 4-2522  
PENNSYLVANIA, Pittsburgh Safety First Supply  
Co. 425 Magee St. Phone: QR. 1-8855  
TENNESSEE, Knoxville Safety Equip. Dist. Co.  
832 West Main Ave. Phone: 3-0943  
TENNESSEE, Memphis J. E. Dilworth Company  
730 South Third St. Phone: 37-0261  
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6000 Denton Drive Phone: FL. 7-2867  
TEXAS, El Paso Mine and Smelter Supply Co.  
P. O. Box 1162 Phone: 2-5431  
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WASHINGTON, Seattle Safety Supply Co.  
115 Blanchard Street Phone: SE. 2780  
WASHINGTON, Spokane Spokane Safety Appl.  
Co. W. 314 Pacific Ave. Phone: MA. 9974  
WEST VIRGINIA, Wheeling Safety First Supply  
Co. No. 1 Garland Ave. Phone: Woodsale 832  
WISCONSIN, Milwaukee Universal Safety  
Equip. Co. 3155 S. 7th St. Phone: HU. 3-7730

## Eye Conservation

—From page 98

The frame must be rigid enough to hold the lenses in proper position in front of the eyes. The nose bridge should be adjustable, or goggles should be available in enough sizes to fit various faces.

Side shields of metal or plastic provide protection against light objects flying from the side. They



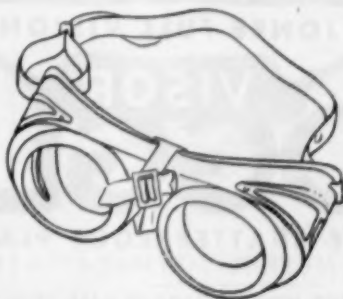
Spectacle type goggle with side shields.

should be used where operations are close together, or where employees work together on the same operation.

Cup goggles are used for heavy grinding, machining, chipping, riveting, work with molten metals, and similar operations.

The cup should be wide enough to protect the eye socket and distribute the impact from any blow over a wide area. The cup should be flame-proof, corrosion resisting, and non-irritating to the skin.

Mask-type goggles, with frames of soft vinyl or rubber, offer protection against splashes of corrosive chemicals and exposure to fine dust. This type is obtainable with lenses of heat-treated or untreated glass or acid-resistant plastic. Some types may be worn over spectacles. The ventilated types are less troubled by fogging.



Cup-type goggles for heavy duty.

Dust goggles, leather mask type, for non-corrosive dusts, are made with heat-treated, untreated or filter lenses. Wire screen ventilators around the eye cup provide air circulation.

Miners' goggles of corrosion-resisting wire screen are used for work underground and in other locations where fogging is a serious problem. The screen is coated a dull black to reduce reflection.

Plastic lenses have qualities of optical glass in light transmission and freedom from distortion. They are light in weight and resist fogging. They are useful for spotwelding, as molten metal does not adhere to plastic as readily as to glass. They withstand considerable impact but are marred or scratched more easily than glass.

Important considerations. Ease of cleaning and sterilization is essential. Most types on the market meet these requirements.



Light-duty plastic goggles

Goggles should be fitted as close to the eyes as possible without touching the eyelashes to give the widest possible angle of vision.

Minimum permissible size for oval lenses is 44.5 mm. in the vertical dimension and 48 mm. in the horizontal. Round lenses should be 50 mm. in diameter.

Lenses should have no appreciable distortion or prism effect.

Strength of heat-treated lenses (resistance to impact) should conform to specifications of the Federal Standard Stock Catalog, the Government's official purchasing guide, Specification GGG-G-G-501B.

Sweatbands, worn across the forehead in hot, humid locations, help prevent fogging of goggles and spectacles.

Non-fogging compounds, applied to the lenses, help to keep the glass clear.

## Face Shields

Face shields of transparent plastic give eye and face protection on such

—To page 103



**get  
modern  
eye protection**

CLEARVIEW VISOR GOGGLE  
MODEL No. 1  
WITH SCREENED PORTS

WITH  
JONES FULL VISION

## VISOR GOGGLES

WITH ALL THESE EXCLUSIVE FEATURES . . .

- ◆ VISOR TOP STOPS GLARE from overhead light
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- ◆ NO FOGGING—no pitting
- ◆ ULTRA VIOLET ABSORBING LENSES
- ◆ NO GLARE, distortion or reflection

**ASSURED  
WORKER  
ACCEPTABILITY**

JONES FULL VISION  
**VISOR  
GOGGLES**

**for INDUSTRY  
and SPORTS**

**ELIMINATE  
EYESTRAIN  
AND  
REDUCE  
FATIGUE**

**ONE-PIECE SHATTERPROOF PLASTIC LENS  
(METHYL-METHACRYLATE)**

FOR NEW CATALOGUE CALL YOUR JOBBER OR WRITE TO:

*Ski Goggles  
Safety Goggles  
Sun Goggles*

JONES AND COMPANY • 125 CATLIN AVE. • RUMFORD, RHODE ISLAND

## Eye Conservation

(From page 101)

jobs as metal-sawing, working with chemicals, buffing, sanding, light grinding, bottle manufacturing, etc.

They should not be used for welding, heavy grinding or where resistance to severe impact is necessary. Shields may be worn over spectacles.

Wire mesh screens are used for pouring low-melting point metals, as in babbiting. The mesh stops splashes of metal and allows better ventilation than a solid shield.

### Hoods and Helmets

**Hoods** (loose-fitting) and **helmets** (rigid frame) of various types are worn to protect the face and head against hazards which do not involve heavy impact.

These are equipped with windows but goggles may be worn underneath. If toxic fumes, dusts or gases are encountered, an air line should be supplied. As these hoods are rather warm, an air line may also be desirable for comfort.

Fabric hoods protect the wearer from nuisance dusts, paint spray, etc.

Fire-resistant duck and asbestos hoods are used for varying degrees of exposure to heat, as in furnace and burning operations and fire fighting.

Hoods and helmets of rubber, neoprene, plastic film, and fabric impregnated with rubber or plastic provide protection against splashes of acids, caustics, organic solvents, etc. Not all of these materials are resistant to all exposures and the manufacturer should be consulted.

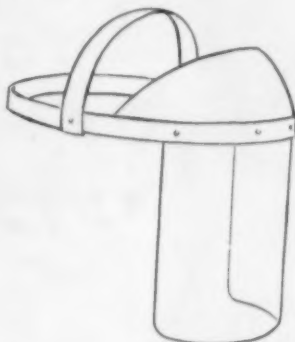
### Harmful Rays

Glass which filters out harmful ultraviolet and infrared rays is available in many types of goggles, face shields and helmets. These filter lenses are worn for welding and cutting, furnace and boiler observation and other operations where there are high temperatures and excessive glare.

**Didymium glass** is used for protection against bright yellow encountered in glass blowing and similar operations. It is also useful for some precision operations in laboratories.

**Melter's goggles** of cobalt blue glass come in spectacle and cup types in graded shades. Lenses with color in the upper half and clear glass in the lower half are also obtainable.

**Sun glasses** are not effective ray-filter glasses for most industrial exposures. They are designed for protection against discomfort caused by sun glare. The better glasses conform to optical standards but many of the cheaper ones show considerable distortion.



Transparent plastic face shield.

**Welding helmets** provide protection for the eyes and face under the severe conditions of arc welding. They are attached to headgear so they can be raised for placing the work. Impact goggles worn under the helmet provide protection when the helmet is raised.

Helmets are made of dielectric fiber resistant to sparks, molten metal and flying particles, and having low heat conductivity. Replaceable cover glass protects filter plate.

Some helmets have a lift-front glass holder which permits rapid inspection of work without removing helmet.

**Welding hand shields** are used on operations where a helmet is not practical, and on tack welding, set-up work, inspection and time study work. Construction is similar to welding helmets.

**Filter Lenses.** The following shade numbers are listed in National Bureau of Standards Handbook H24:

No. 3—For protection against glare or reflected light, spot welding operations, light brazing.

No. 4 or No. 5—Light acetylene cutting and burning.

No. 6—General acetylene welding, or welder's helper or set up on arc welding.

No. 8—Heavy acetylene welding or cutting, or very light arc welding.

No. 10—Arc welding up to 250 amperes.

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Welding helmet

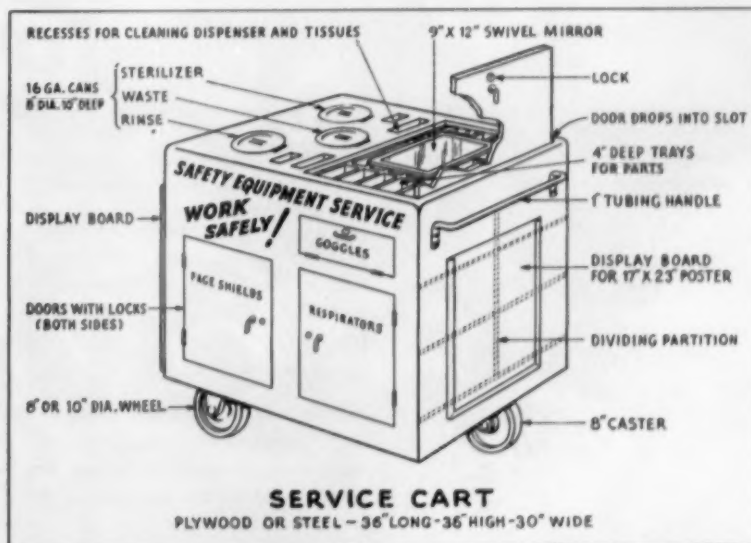


Diagram of mobile service cart for cleaning, sterilizing and adjusting goggles, face shields and respirators. The cart tours the plants servicing equipment on the job.



**M-10** non-prescription white plastic frame, for general indoor use in non-hazardous areas.



**Z-72** same as above, with added protection of side shields.



**M-30** metal style with full face plate temples, for general use in non-hazardous areas.



**Y-70** non-prescription metal beryllium, ideal for shop, factory and office personnel who have normal to mild near-sightedness.



**Z-77** same as above, but with the added protection of side shields.



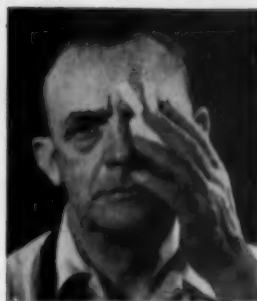
**S-71** transparent covers, may be worn over prescription lenses, for general use for the most severe hazardous hazards.



**W-33** flexible eye shield, lightweight, with impact lens. 3-way ventilation. Nonfogging.



# How to be sure the protection meets the hazard



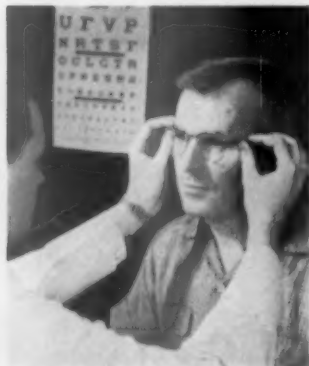
First—know the hazards, job by job. Then, know your eyewear.

Know how far a safety lens and frame will go (and what their limits are) in protecting a worker from specific hazards—from impact, from flying particles, from dust, fumes, splash, or harmful light energy radiation.

And to keep safety eyewear where it belongs, on the face, be sure it's designed to fit comfortably and provide maximum visual freedom for the wearer.

Best way to be sure that eye protection meets the hazard is to consult an expert from this 101-year-old pioneer designer and manufacturer of industrial eyewear. He's fully qualified to help with any problem.

Shown opposite are a few of the eyewear types offered by Bausch & Lomb to meet specific job hazards. For the complete line, write for catalog, "Complete Eye Protection." Bausch & Lomb Optical Company, 90339 Smith St., Rochester 2, N. Y.



Where visual correction is needed, Bausch & Lomb recommends the complete services of eye care specialists.



# RESPIRATORY PROTECTION

**RESPIRATORY** equipment protects the worker against inhalation of air contaminants. These range from relatively harmless "nuisance" substances to toxic dusts, vapors, mists and gases.

Removal of contaminants at the source and enclosure of processes helps to keep down concentrations of harmful substances in the work-room air. However, leaks and breakdowns may occur, and there are operations where exposure is brief or infrequent. For such contingencies, personal protection should be provided.

The worker's air intake may be safeguarded by three principal methods:

1. Mechanical filters to remove dusts and mists.
2. Absorption or chemical reaction to remove gases and vapors.
3. Supplied air.

**Types.** Five general types of respiratory equipment are:

1. Canister gas masks.
2. Chemical cartridge respirators.
3. Filter respirators.
4. Supplied air equipment (hose masks and air-line respirators).
5. Self-contained apparatus supplying oxygen or air.

Each type of equipment has a definite field of usefulness, as well as limitations. Manufacturers and dealers want to know the type of exposure when equipment is ordered.

**Approval.** Equipment which meets accepted standards carries the label of the Bureau of Mines. Approval specifies type of exposure as well as design and construction.

## Gas Masks

A gas mask consists of a face piece connected by a flexible tube to a canister. Inhaled air is drawn through the canister which cleans it chemically. No one chemical yet discovered will remove all contaminants, so the canister must be chosen for the exposure.

The nearest approach to complete protection is the universal mask for protection against combinations of acid gases, organic vapors, ammonia, carbon monoxide and smokes. It should be remembered, however, that as the number of gases increase, the service time of the canister decreases.

Canister gas masks with full face piece are for emergency protection in atmospheres immediately dangerous to life. Their effectiveness is limited to concentrations of 2 per cent by volume, except for ammonia for which the limit is 3 per cent.

**Characteristics.** Types of gas masks, their identifying colors and uses are:

- A. White—Acid gases, such as hydrogen sulfide, sulfur dioxide, chlorine, hydrocyanic acid.
- B. Black—Organic vapors, such as aniline, benzene, ether, gasoline, carbon tetrachloride, chloropierin.
- C. Green—Ammonia gas.
- D. Blue—Carbon monoxide.
- AB. Yellow—Combination acid gas and organic vapor.
- ABC. Brown—Combination acid gas, organic vapor and ammonia gas.
- N. Red—Universal—Acid gases, organic vapors, ammonia, carbon monoxide and smokes.

## Cartridge Respirators

Chemical cartridge respirators usually have a half-mask face connected directly to a small container.

Chemicals are similar to those used in gas masks.

Cartridge respirators are used only for non-emergency situations—for atmospheres which are harmful only after prolonged or repeated exposures.

## Filter Respirators

Protection against any form of particulate matter can be provided by a mechanical filter respirator of proper design. Major items to be considered are resistance to breathing offered by the filter element, adaptation of face piece to faces of various shapes, and fineness of particles to be filtered out.

ASA Code Z-2 requires that the complete respirator show a resistance not in excess of 50 mm. of water to inhalation at a rate of 85 liters of air per minute. Resistance to exhalation under the same conditions may not exceed 25 mm. Commercial respirators are usually held to considerably lower resistances.

Mechanical filter respirators are not effective against solvent vapors, injurious gases, or oxygen deficiency.

Types of mechanical filters approved by the Bureau of Mines are:

1. Pneumoconiosis-producing and nuisance dust respirators, for such dusts as aluminum, cellulose, cement, charcoal.

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Checking and repairing goggles and respirators at Baytown Refinery, Humble Oil and Refining Company. (Courtesy "The Humble Bee")

## *The Lady Agrees...*



### *It Takes Foresight* **TO SAVE EYESIGHT**

1. To encourage the practice of eye safety.
2. To keep safety eyewear—glass or plastic—comfortably clean and clear.
3. To keep goggles free from steam and fog for a working day.
4. To make workers willing wearers of safety eyewear.

### **THOSE IN THE KNOW . . . PREFER**

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K-LENS-M Liquids are  
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Send company letterhead for FREE sample.

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For Best Results Always—Always Use K-LENS-M Products.

**SEE OUR EXHIBIT IN BOOTH 57, GREATER NEW YORK SAFETY COUNCIL SHOW**



# Respiratory Protection

(From page 106)

coal, coke, flour, gypsum, iron ore, limestone, and wood.

2. Toxic dust respirators, for protection against toxic dusts that are not significantly more toxic than lead, such as arsenic, cadmium, chromium, lead, manganese, selenium, vanadium, and their compounds.

3. Mist respirators, for protection against pneumoconiosis-producing, chromic acid, and nuisance mists.



Filter-type respirator.

4. Fume respirators, for protection against fumes (solid dispersoids or particulate matter) formed by condensation of vapors, such as those from heated metals or other substances.

## Supplied Air

**Hose masks.** Atmospheres immediately hazardous to life require air supply from a point beyond the contaminated area. With a hose mask, air is normally supplied by a blower. The wearer can inhale through the hose when the blower is not operating.

**Hose lines** (with at least a 1-inch connection) are recommended rather than air lines with connection to a compressed air system for most operations. In a case of failure of air supply, it is possible to breathe through a considerable length of hose.

Hose masks are not approved with more than 150 feet of hose or where inhalation resistance exceeds 2.5 inches of water, or the exhalation resistance exceeds 1 inch of water.

Attachments of additional hose should not exceed the total prescribed length and should be approved for use with that type of mask and should have approved couplings. The blower should be located so that only fresh, clean air is supplied to the face masks.

The hose mask should always be used for work which involves entering tanks or pits where there is a dangerous or unknown concentration of dust, mist, vapor, or gas, or oxygen deficiency.



Hose mask for irrespirable atmospheres.

**Harness** to pull the hose lines requires inspection prior to use. The minimum requirement is that component parts of harness shall withstand a pull of at least 250 pounds.

## Eye, Head and Respiratory Protection — Definitions

### National Bureau of Standards Handbook H24

**Protector.** A device placed in front of or over the eyes, face or head to afford protection from the hazards in industrial processes or from the natural elements.

**Goggles.** An optical device worn in front of the eyes, whose predominant function is protection to the eyes only.

**Face Mask.** A device worn before the eyes and a portion or all of the face, whose predominant function is protection to the eyes and face.

**Helmet.** A rigid device worn by the operator which shields the eyes, face and neck, and a portion or all of the other parts of the head and is held in place by suitable means.

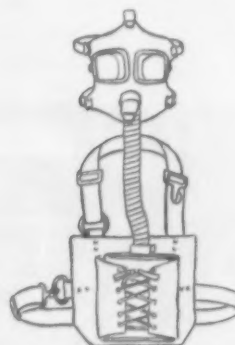
**Hood.** A non-rigid device which completely covers the head, neck and portions of the shoulders so as to exclude dust and flying particles.

**Shield.** A device held in the hand, or supported without the aid of the operator, whose function is protection to the eyes and face.

**Gas Mask.** A device worn on the face, and so arranged that the inhaled

## Air-Line Respirators

Air-line respirators, connected to compressed air-lines, provide essentially the same protection given by hose masks. They are not intended



Canister gas mask.

for atmospheres immediately hazardous to life where the wearer could not escape if failure of the air supply required him to remove the respirator.

This respirator differs from the hose mask mainly in two features: It has a hand-operated, quickly detachable coupling connected to the belt or body harness so that the

—To page 110

air is drawn entirely through a canister which cleans it chemically.

**Supplied-Air Respirator.** A device designed to supply the wearer with air suitable to breathe while surrounded by a contaminated atmosphere, and to prevent the latter from being inhaled.

**Hose Mask.** A supplied-air respirator having a tight-fitting facepiece to which is attached a hose through which air may be forced by a blower, and through which the wearer can inhale whether the blower is operating or not.

**Air-Line Respirator.** An air-line respirator is a supplied-air respirator designed to be connected by a hose to a supply of fresh air under positive pressure sufficient to maintain a continuous flow into the facepiece.

**Filter Respirator.** A device designed for the wearer to inhale the surrounding atmosphere after it has passed through a filtering medium to remove the impurities. The filtering medium may chemically absorb or mechanically obstruct the impurities.

**Cartridge-Type Respirator.** A filter respirator whose filtering equipment is carried in one or more cartridges mounted on the facepiece. Such a respirator may be a mechanical filter respirator, a chemical filter respirator, or a combination of both.



For 50 Years... Sold the World Over

# FIBRE-METAL HELMETS

THEY'VE HAD TO BE GOOD!

● The name FIBRE-METAL stands for highest quality...quality preeminent in the field of welding...based on broadest experience and continuing research to produce the kind of equipment that gives maximum protection to the welder... along with the comfort and "work ability" that enable him to produce more work per day.

**FIBRE-METAL HELMETS: First with Fiberglas!\***



No. 600-3-C  
No. 602-3-C



No. 604-3-C  
No. 606-3-C



No. 700-3-C  
No. 702-3-C



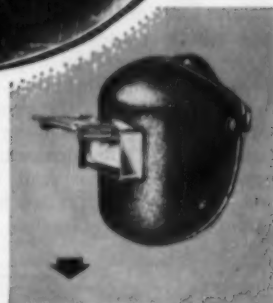
Inside view showing INNER SHELL of "Series 600" Helmets for extra protection to welder's neck from flashes and reflected glare.

\*OWENS-CORNING TRADE MARK



No. 400-3-C with #1130—Plastic Glass Holder

No. 402-3-C with #1085—Insulated Steel Glass Holder



No. 404-3-C with #1136—Plastic Lift-Front Glass Holder

No. 406-3-C with #1096—Insulated Downmetal Lift-Front Glass Holder

## NEW

### "Series 400" Helmets

The smaller size and light weight of the Fibre-Metal Series 400 Helmets make them ideal for close quarters. They feature Fibre-Metal's superior Fiberglas\* compression-molded shells, Beaded edges for strength and safety, Wide Range Headsizes Adjustment, New 4-Position Helmet Stop, and provide four popular glass holder styles. Adjustable friction joints hold helmet in any position!

### HELMET FEATURES:

LIGHT WEIGHT • EXCEPTIONAL STRENGTH • MOISTUREPROOF  
NON-WARPING • HEAT RESISTANT (SELF EXTINGUISHING)  
EASILY STERILIZED

### OVER 30 TYPES TO MEET YOUR NEEDS

When buying any welding equipment...always ask for a FIBRE-METAL product!



### WORKER SAFETY PAYS DIVIDENDS

WE ADHERE TO THE MAXIMUM OF QUALITY—PRODUCTS FOR ALL

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CHICAGO, ILL.



WELDING HELMET



"SPRAY" ATTACHMENT



WELDING TORCH



WELD MASK



WELD CLEANING HAMMER



FIBRE-METAL SYSTEM

# Respiratory Protection

(From page 108)

operator can connect to a compressed air hose, also a flow-limiting device with capacity to permit air flows only between 2 and 20 cubic feet per minute.

A trap and filter installed in the compressed air line ahead of the masks to separate oil, water, scale, or other extraneous matter from the air stream is desirable.

An air-pressure regulator in the line is required if air is supplied at a pressure in excess of 25 pounds per square inch, also a pressure release valve which will operate if the regulator fails.

Supplied-air respirators are the most desirable for operations requiring continuous use of a respirator at one location. Other types may give adequate protection, but they offer breathing resistance and are consequently more fatiguing.

To obtain clean air, the compressor intake must be kept away from all sources of contamination. The compressor should be well maintained. It must not run too hot, as dangerous amounts of carbon mon-

oxide can be produced by decomposition of lubricating oil.

**Air-supplied suits.** Sometimes rescue or emergency repair work must be done in atmospheres extremely corrosive to the skin and mucous membranes, in addition to being acutely poisonous. For these conditions, complete suits of impervious material with breathing equipment are available.

If a hose line is used, it should be connected to the suit itself as well as to the helmet. It is fatiguing and dangerous to wear such a suit for a long period unless it is well ventilated.

## Abrasive Blasting

Abrasive blasting requires not only an adequate supply of filtered air, but also mechanical protection for the head and neck. This protection can be supplied either by an impregnated cloth hood or by a helmet of some rigid material. It should be covered both inside and outside with a plastic material, such as soft

rubber, to increase both comfort of wearer and resistance to abrasive.

A window of transparent material, suitable for optical use, protected from the abrasive by a 30- to 40-mesh fine wire screen should be provided. Both window and protective screen should be readily replaceable.

## Self-Contained Apparatus

For work in atmospheres immediately hazardous to life at distances more than 150 feet from the source of fresh air, self-contained oxygen-breathing apparatus should be used.

The two principal types of self-contained apparatus are: (1) Compressed air or compressed oxygen type; (2) Internal generation type which produces oxygen by reaction of chemicals in the canister with the moisture in exhaled breath.

## Care of Equipment

A central station for care and maintenance of respiratory equipment is desirable where many respirators are in use. Such a unit can also handle distribution and maintenance of other items of personal protective equipment.

Each employee should be provided with two respirators and either a locker or a hook at the central sta-



# SEECLOTH

## CLEANS AND MISTPROOFS

### WHAT SEECLOTH IS:

SEECLOTH is a chemically treated fabric which when rubbed on glass both cleans and prevents fogging or misting. It has found use in industry as a convenient method for cleaning and preventing the fogging of goggles of workers who must protect their eyes in various industrial operations.

### ECONOMICAL:

It is the most convenient and economical method known for this purpose. One piece (8" x 9") will last for a number of months when used on goggles or glasses.

### INCREASES WORKER SAFETY:

The fact that the worker has the means for preventing misting of his goggles right on the job increases the safety of the operation since it reduces the temptation to continue to work with misted glasses. He can fogproof them without leaving his work.

### HOW TO USE SEECLOTH:

All that is necessary is to wipe the dry or very slightly moistened glasses with the dry SEECLOTH and thus mist-proof the glasses for a considerable period.

### OTHER USES:

SEECLOTH has also found use in preventing misting of the inside of windshields in foggy or damp weather. Here also all that is necessary is to rub the dry or very slightly moistened glass surface with the dry SEECLOTH. Mist will then not form on the area that is rubbed. Other applications include its use on spectacles, mirrors, windows, etc.

### HOW SEECLOTH IS PACKAGED:

3" x 8" pieces (not individually packaged). Suitable for eyeglasses and may be kept in the case with the glasses. 8" x 9" pieces (individually packaged in 3 1/2 x 6" polyethylene envelopes). Suitable for goggles and masks and fits easily in the pocket of coveralls. 16" x 18" pieces (individually packaged in 5" x 10" polyethylene envelopes). Suitable for automobile windshields, household use, etc., and fits comfortably in the glove compartment of a car or in the drawer of a kitchen cabinet.

In addition to the standard sizes listed above, SEECLOTH will be cut to special sizes on order and is available by the yard—36" wide.



### HYGIENE RESEARCH, INC.

484 BROADWAY, NEW YORK, N. Y.  
2704 S. HILL ST., LOS ANGELES, CALIF.  
Samples on request. Write Dept. N55-3



tion. Respirators should be branded or tagged with a number to indicate the employee to whom it is assigned.

The respirator should be turned in to the central station at the end of each shift to be cleaned and sterilized, and repaired if necessary.

Where the maintenance crew works several shifts, one respirator per employee may be sufficient. Usually, however, it is necessary to have one complete unit in the process of cleaning while the other is being worn.

Filters should be replaced when clogged, and the used ones discarded. Canisters should be replaced at regular intervals as recommended by the Bureau of Mines. Even when not in use they lose their effectiveness with time.

**Cleaning and disinfecting.** All parts, except canisters and cartridges, should be cleaned after use. Face pieces, air lines and hose may be washed with soap and water, rinsed in clear water, and dried.

All respiratory devices should be disinfected before being passed from employee to employee. Methods of disinfection include:

1. Immersion in solution of quaternary ammonium salt detergent. This material is not injurious to skin or to rubber.

2. Subjection to a moist atmosphere of antiseptic gas, such as formaldehyde, for 10 minutes.

3. Immersion for 10 minutes in a solution of formalin made by dissolving 1 part of 40 per cent formaldehyde in 9 parts of water.

Parts should be rinsed thoroughly after sterilizing to remove traces of disinfectant, then dried.

Elastic head bands may be damaged by sterilizing but they should be washed with soap and water. Bands should be replaced when the respirator is transferred to another employee.

### What Is "Good Vision"?

**Near acuity.** Ability to focus and see well with both eyes separately at a distance of 15 inches. This is the distance at which most machine and office work is done.

**Distance acuity.** Ability to focus eyes for a distance of 20 feet or more. This is necessary for crane operators, jeep and truck drivers, railroading, for example.

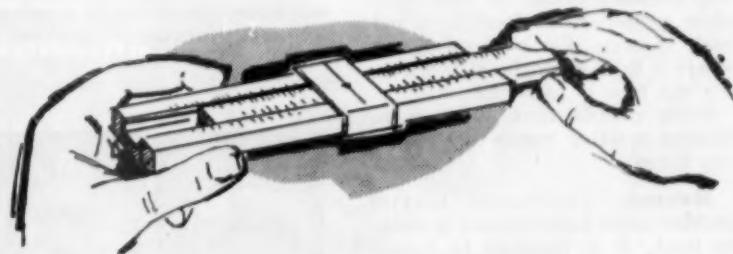
**Adequate field of vision.** Ability to see to both sides, and up and down, while focusing on a small target.

**Depth perception.** Ability to judge space relationship. This is important for accuracy in almost any job.

## HOW STASAFE ENGINEERING OVERCAME THE SEEPAGE MENACE

Could this happen when liquids splash on YOUR face shields?

Liquids do run down the outside of a fibre dome (1) . . . follow the shape of the shield (2) . . . and seep inside (3) through tiny gaps between the plastic front and the fibre dome. This constant hazard of corrosive liquids inside the shield cannot be ignored!



In seepage protection, as in many other phases of industrial safety, Sta-Safe engineering was first to solve the problem. As you see, the acetate front on StaSafe face shields No. 15 and No. 5 is actually inserted in the channel (1) under the fibre top, making seepage impossible. Liquids following the shape of the shield must run down the outside (2) of the plastic front.

Positive seepage prevention is just one of the many advanced construction features of StaSafe shields guaranteeing you outstanding performance . . . with maximum economy.

*For More Complete Information  
on StaSafe Face Shields Write in  
Today for Free Bulletin S-9.*

### STANDARD SAFETY EQUIPMENT COMPANY

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LOS ANGELES 16, CAL.  
2952 CRENSHAW BLVD.



# HEAD PROTECTION

**HEAD INJURIES** due to falling objects are a serious hazard in many industries. Examples are logging, construction work, mining, ship-building, and much maintenance work. Protective hats have become standard equipment in these operations. Their use is also growing in the public companies where linemen wear them for protection not only against falling objects but also against contact with live wires overhead.

Protective hats are also useful where there is danger of bumping the head against overhead structures.

Requirements for protective hats are:

1. Protection against impact.
2. Resistance to fire.
3. Resistance to moisture.
5. High dielectric strength (where there is possibility of contact with live electrical equipment).
6. Light weight.

**Types.** A hat with a brim all the way around provides the most complete protection for head, face and back of neck. For confined spaces where a brim might be in the way, the cap type is preferred.

Some models have brackets to support welding masks or miners' cap lamps.

**Materials.** Laminated plastic molded under high pressure is widely used. It is resistant to impact and to effects of water and oil. Dielectric strength is high.

Glass fiber impregnated with resin has a high strength-weight ratio, high dielectric strength and resistance to moisture.

Hats which glow in the dark, due to a phosphorescent pigment, are obtainable on special order.

Aluminum alloy is light in weight and meets all requirements for resistance to impact and moisture but it is low in dielectric strength. Metal hats should not be worn where there is danger of electrical contact and they do not meet specifications for many occupations.

**Weight.** Not more than 14½ ounces for the complete hat is specified by Federal Specification No. 367A (U.S. Treasury Department, Procurement Division). The specification also lists several tests which hats must pass. These include moisture, impact and electricity.

The hard outer shell of the hat is supported by a cradle or hammock

which keeps the shell away from the head and cushions it against blows.

Cradle and sweatband should be replaceable because of deterioration when exposed to perspiration for long periods. This is also important for sanitary reasons, especially when the hat is worn by more than one person. The shell can be sterilized by any of the common methods.

For cold weather a winter lining may be attached to the hat. This lining is made of water-resistant cloth to protect head, neck and ears.

Where the wearer may be exposed to strong winds on such locations as bridges and oil derricks, a chin strap is useful.

An eyeshield of transparent plastic can be attached to some types of hats. It is hinged under the peak and lies flat against the peak when not in use.

**Work caps.** Where protection against impact is not required, light cloth caps are worn to protect the hair against paint splashes, dust, oil and other non-corrosive substances.

Recently introduced are work caps of heavy Kraft paper treated with neoprene, and a flame retardant. The

material is water-repellent and resistant to acids and alkalis. Cost is about 30 per cent less than most cloth caps.

**Colors.** With some manufacturers, hats are now available in seven standard colors—white, gray, red, green, blue, brown and black. Other colors are available on special order. Color is permanent because it goes all the way through the material.

Special colors are sometimes ordered, or stock hats painted, to match the color used by the company on vehicles, in advertising, etc.

Distinctive colors and designs are also used to designate the wearer's department or trade. This is often done in large plants where certain areas are restricted to authorized employees.

No standards have yet been compiled for the use of color for identification of the wearer. Many civil defense groups have established codes and some industries have adopted similar plans. One of the most extensive codes is that developed by the Higgins Company, New Orleans:

- Red—Pipe workers
- Blue—Fitters
- Green—Welders
- Buff—Rigging
- Yellow—Electrical
- Black—Labor
- Gray—Burning
- Brown—Carpenters
- Brown bottom, white top—Painters
- Red bottom, blue top—Machinists
- Gray bottom, white top—Shear and Blacksmith shops
- Lavender—Expeditors
- Aluminum—General foremen
- Brown bottom, yellow top—Caulkers and sanders

A black line on a helmet denotes a foreman and a red line a leaderman. Badge numbers are also stenciled on the front of each helmet.

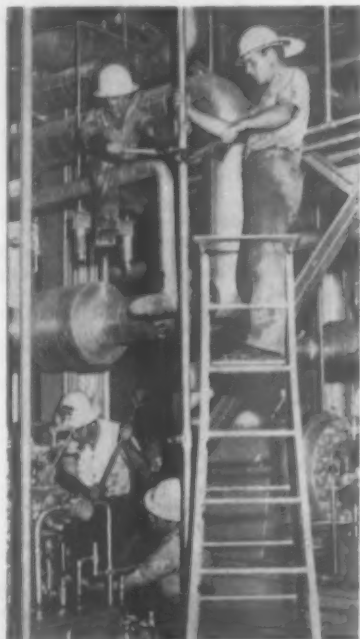
Wearing protective hats is included in the union contracts and the unions have helped in educating their members on the need for head protection.

## Caps for Women

Women are seldom employed in occupations where protective hats are required. Their hair, however, provides a problem around moving machinery. Much effort has been expended in designing headwear that provides adequate protection and is reasonably attractive in appearance.

Scalping is likely to occur at points where hair may come in contact with rotating parts, or where enough static is produced by the machine to lift the hair.

—To page 114



Hard hats protect the head from bumps as well as from falling objects. Plastic hats also provide protection around electric equipment. The platform ladder is useful for a variety of maintenance jobs. (Mine Safety Appliances Co.)





**DUPOR  
No. 4**  
For nuisance  
dusts and fumes.  
Weighs only  
4 oz.

**\$2<sup>00</sup>**



**DUPOR  
No. 40**  
U.S.B. of M.  
Approved.  
Has 40 sq. in.  
filters for  
Pneumoconiosis  
producing and  
nuisance dusts.

**\$3<sup>00</sup>**



**DUPOR  
No. 46**  
U.S.B. of M.  
Approved for  
Pneumoconiosis  
producing and  
Lead dusts.

**\$3<sup>25</sup>**



**BE SURE  
OF THE  
AIR YOU  
BREATHE**

**Wear a  
Genuine**

# DUPOR

REG. U. S. PATENT OFF.

## Respirator

light weight • greater visibility • no blind spots  
face cloth for personal sanitation • panorama view  
controlled breathing • exclusive patented features

**H. S. COVER**  
South Bend, Indiana

**DUPOR  
No. 1**

Miniature  
nose mask for  
nuisance dusts  
and fumes.

**\$1<sup>20</sup>**



**DUPOR  
No. 24**

U.S.B. of M.  
Approved.  
Has 24 sq. in.  
filters for  
Pneumoconiosis  
producing and  
nuisance dusts.

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**DUPOR  
No. 10**

Chemical  
cartridges.  
For organic and  
inorganic gases.

**\$5<sup>00</sup>**



**DUPOR  
No. 20**

Double sponge,  
for cool,  
water-washed  
breathing.

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**DUPOR  
Automatic**  
With  
sponge filter  
for water-cooled  
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**DUPOR  
Smoke Mask**  
Equipped with  
"Nod & Shake"  
fog-proof,  
gas-tight goggles.

**\$5<sup>00</sup>**



**COVER'S  
"Nod & Shake"  
GOGGLES**

Gas-tight,  
fog-proof.  
Wear with any  
respirator.

**\$2<sup>00</sup>**

## Head Protection

—From page 112

Enclosing the machine may be practicable in some operations but women who work around such machinery should wear caps which cover the hair completely. Hair covering is also desirable from the standpoint of cleanliness in many occupations.

Hair covering should be made of fabric sufficiently durable to withstand repeated laundering. Design should be simple so that pressing may be done by machine.

Flame-retardant material should be used if worn near spark or flame.

**Caps** with peaks provide warning before the head comes in contact with a moving object. They should be provided in a sufficient variety of head sizes or with a sufficient range of adjustment to fit all persons.

After caps have been accepted by women, there is still the problem of getting them to wear the caps correctly. Frequently they wear them on the back of the head, so that the hair over the forehead is exposed. It may take a realistic demonstration of the hazard of contact with a revolving spindle to discourage the practice.

**Hair nets** or turbans, preferred by many women, are not considered sufficient protection around moving machinery. Sometimes their use is a compromise with feminine taste.

## Unusual Punishment For a Hard Hat

Protective equipment sometimes protects an employee against hazards never dreamed of by the manufacturer of the equipment or by the company safety department. Recently, Ernest Plummer, an employee of the Freeport Sulphur Company at Grand Ecaille had the good fortune to be wearing his hard hat when he encountered a non-occupational hazard.

After cashing a semi-monthly paycheck in Port Sulphur, he caught a ride to Buras with friends who live in that area. It was dark when they dropped him a few blocks from his home and Plummer took his usual shortcut through an orange grove. He was halfway through the dark grove when a man stepped from behind a tree and banged him on the head with a blunt object. The blow sent him sprawling.

Plummer got up and his attacker gave him a second blow across the steel helmet, again knocking him on his face. The would-be bandit struck him twice more before making tracks through the trees.

Plummer, his head reeling, managed to get home with a bump the size of a hen's egg on his head and two large dents in his helmet, but his pay was still safe in his wallet.

Plummer believes the man was wielding a blackjack or a length of iron pipe.

## Eye Protection

—From page 103

No. 12—Arc welding of more than 250 amperes, atomic hydrogen welding.

No. 14—Carbon arc welding.

Goggles are available in shades up to No. 8; higher numbers in helmets.

Heat-treated cover lenses can be provided to protect filter lenses against pitting and scratching. Heat-treated filter lenses are also available.

## Administering the Program

**Supply and Distribution.** In some companies the supply is kept in the main supply department. In larger plants a supply of goggles and repair parts may be kept in each shop.

Some operate goggle carts with trained attendants who make the rounds, cleaning, adjusting, repairing and replacing goggles on the job.

**Fitting goggles.** Prescription glasses should be fitted by a refractonist but fitting plano goggles also

## TO CONSERVE EYES

1. Make periodic surveys of work areas for eye hazards.
2. Provide type of protection suitable for the job—goggles, shields, masks, hoods, etc.
3. Make provisions for corrective lenses for those who need them.
4. Provide adjusting service and encourage employees to keep goggles in adjustment.
5. Be sure that all those in the work area have goggles, including employees from other departments.
6. Encourage employees to report foreign bodies in the eyes immediately for medical treatment.
7. Supervisors should wear goggles for their own protection as well as for the example to employees.
8. Insist on eye protection for visitors as well as for workers.

requires training and experience. Many optical companies offer instruction in this work. Unless goggles are fitted properly there will be opposition to eye protection.

**Cleaning and sterilizing.** Both goggles and spectacles become smudged and facilities for cleaning them on the job are desirable. Stations which dispense cleaning liquid and tissues encourage frequent cleaning.

Goggles kept in stock and reissued to other employees should be cleaned and sterilized at frequent intervals. Goggles worn by only one person should receive the same care.



Employees modeling various items of personal protection. All are wearing safety glasses. Left: sweatband, hot mill gloves and asbestos apron. Center: rubber sleevelets and coated fabric apron and leather gloves.



# Safety men

## get your **NEW WILLSON Safety Catalog!**

Willson, the leader in research and development of safety equipment since 1870, offers this new catalog to all men responsible for safety. It illustrates and fully describes the complete line of Willson eye, respiratory and head protective equipment.

For easy, practical use, the catalog is divided into four major sections:

### **EYE PROTECTION:**

featuring a complete line of spectacles, including the unique Contour-Spec® and the high-styled and most comfortable Willson Bronze spectacle; cup goggles including the king-size molded nylon Kover-Mor® goggle; and plastic eye protection including the new, more roomy MonoGoggle® and the new, all-plastic Feather Spec®.

### **HEAD PROTECTION:**

featuring the new line of Super-Tough® Safety Hats and Caps. These new hats provide greater protection and comfort for the wearer than any other safety hat currently available. They feature the exclusive patented geodetic crown straps and pneumatic head band.

And for the first time, Willson is announcing a new,

all plastic electrical insulating safety hat. This hat fully meets the insulating requirements of the new Edison Electrical Institute specifications.

### **RESPIRATORY PROTECTION:**

This section covers the complete line of Willson Respirators and gas masks. Here you will find the popular 800 series, double filter and the 400 series, single filter interchangeable respirator. This unique respirator requires only a change of filters or cartridges with no additional parts, spacers, or washers to provide protection against dusts and organic vapors, paint spray, acid gases, ammonia, metal fumes, dusts and mists and radio active and beryllium dusts, mists and fumes.

### **WELDING PROTECTION:**

This section covers the complete line of Willson welding goggles, helmets, hand shields, welding lenses and cover glasses. Featured in this section is the new, one piece, Fiberglas welding helmet in both head band models and with lugs for use with the new, Super-Tough® safety caps.

Get your copy of this new, workable, easy to read and use Willson Catalog. Fill out and mail the coupon for your copy.



Willson Products, Inc.  
205 Washington Street  
Reading, Pennsylvania

Please send me your new catalog and working manual on the complete line of Willson Safety Equipment.

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COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

# COVER GOGGLES

## FOR COMPLETE PROTECTION



**STAC-VENT (SV)** . . . a new principle in goggle ventilation, proven to provide clearer fog-free vision, more comfort and greater safety. Other types of ventilation available: Regular Ventilation (RV), Screen Ventilation (CV), or No Ventilation (NV).

**Safe, Shatterproof Lens Easily Replaced.** Eye Savers lenses will not shatter or splinter with impact . . . will not pit. Lenses are easily replaced by removing the "lock bar" that positively locks the lens in the frame. No special tools needed. Lenses are interchangeable in all Soft Vinyl Frames.



### For Safe, Comfortable, Form-fit

**Model 440 SV—clear frame 460 SV—green frame**

Heavy Impact Goggles with replaceable, optically perfect, methacrylate lenses.

Clear Lens (C) .125" thick

Green Lens: Light (G2) Medium (G3) .080" thick

**Model 441 SV—clear frame 461 SV—green frame**

Average Impact Goggles with replaceable, optically perfect, acetate lenses.

Clear Lens (AC) .060" thick

Green Lens (AG) 0.50" thick

**Models 490 or 491 — opaque black frames**

Furnished with Stac-Vent only

Methacrylate Lenses: same as 440

Acetate Lenses: same as 441

**Fits Over Any Prescription Frame** — Extra wide 6" lens in the large vinyl frame provides ample space for metal or horn rimmed glasses. Frame forms a bumper that prevents the lens surface from touching when goggle is laid flat on a table or bench.



**Safer, More Comfortable to Wear** — Eye Savers, soft Vinyl frames form-fit any shape face comfortably. Flanged nose bridge fills the gaps around the nose to assure greater protection. Adjustable, elastic headband holds goggles in position.



**WELDING GOGGLE Model 492**

Large opaque black vinyl frame form-fits the face. Stac-Vent provides light-tight ventilation. Removable lens holder holds replaceable standard 50 mm round, Federal Specifications, welding filters—shades 3, 4, 5, or 6 available. Glass filters protected inside and outside by acetate cover lenses.



**COVER GOGGLE Model 442 SV**

Same frame as Model 440 with interchangeable lens holder holding standard 50 mm round safety glass lenses. Provides maximum protection where there is extreme abrasion. Glass lenses easily replaced in lens holder. Cover lenses can be provided to protect glass lenses from pitting.



**CHEEPEE Model 99**

Low cost one-piece acetate goggle . . . close fitting, lightweight and comfortable. A special forming process never effects the lens surface . . . provides optically perfect, full, all around vision . . . no distortion of image. Adjustable, elastic headband provided. Available in clear and medium green.



**D-LUX Model 100**

One piece, acetate goggle fits over most prescription glasses. Formed optically perfect with full all around vision . . . no distortion of image. Adjustable, elastic headband provided. Exceeds federal specifications for resistance to breakage and for optical qualities. Available in clear and medium green.

Quality Eye Protective Equipment

Made by the Leaders in Plastics



**WATCHEMOKET OPTICAL CO., INC.**

234 West Exchange St. PROVIDENCE 3, R. I.

In Canada: Levitt-Safety Limited, Toronto 10, Montreal 24



# SAFETY SPECTACLES

## FOR LIGHT WEIGHT AND COMFORT

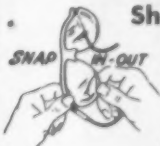


**For 90% Protection Worn All the Time**

**Model 415** — plastic retrax temples (illustrated)

**Model 412** — metal retrax temples

**Model 410** — plastic club temples

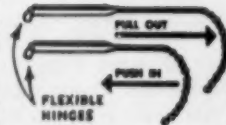


### Shatterproof Methacrylate Lenses

**Replaceable — Interchangeable —** Eye Savers "Tuc-Away" lenses are plano, optically perfect, .080" thick for safe, impact protection; will not shatter or pit. They provide full, clear vision with side shield protection or cup type side and bottom protection. Available in clear, green and gold shades.

tion or cup type side and bottom protection. Available in clear, green and gold shades.

**Economical** . . . initial cost is low, maintenance is eliminated, replacement lens cost is low. It pays to have 90% protection 100% of the time instead of 100% protection only 50% of the time.



**Adjustable Retrax Temples** — Plastic or metal Retrax Temples telescope in and out to provide proper head fit. Universal Nose Bridge assures comfort and eliminates need for extra stock sizes. One size fits all.

### SPECIFY LENS BY CODE NUMBER

Type Lens	Clear	Light Green	Med. Green	Gold
Regular Side Shield	CSS	G2SS	G3SS	YSS
Full 1" Side Shield	CSSF	G2SSF	G3SSF	YSSF
Semi-Cup Shield	CSC	G2SC	G3SC	YSC
Full-Cup Shield	CFC	G2FC	G3FC	YFC

### VISOR-TUC

The Visor-Tuc with over eyes "VISOR" provides almost 100% protection with comfort. Visor fits snugly against the forehead. All lenses are interchangeable in Tuc-Away.



**Model 425** — plastic retrax temples

**Model 422** — metal retrax temples (illustrated)

**Model 420** — plastic club temples



### FRAME ONLY Model 80

Furnished for prescription use with standard 47 mm P-3 shape lenses. Lenses not furnished.

### FRAME WITH PLANO Model 80 MS

Safety spectacles with optically perfect, curved, methacrylate lenses, .080" thick, clear (MSC), light green (MSG2), medium green (MSG3).



### SNAP-ON SHIELDS Model 115

Extra side protection with prescription safety spectacles can be obtained by snapping on these deep cup acetate side shields. Will fit on all sizes of safety frames. Available in clear (AC) or medium green (AG). These eye shields are easy to attach and remove, thanks to nickel silver clip-holders which hold them in place.



### TUC-OVER Model 175 Medium Model 176 Large

Featherlight Tuc-Overs are all plastic with integral visor protection. Replaceable, optically perfect lenses are shatterproof, curved methacrylate .080" thick, available in clear (C) light green (G-2) and medium green (G-3). Frames are available in a choice of translucent white or green in medium or large.



### METHASPEC Model 55

Low cost Methaspec Eye Shields are the ideal visitors' protection. The lens and visor are molded in one piece, formed of guaranteed optically perfect .080" thick methacrylate in clear (C) with black painted visor, light green (G-2) and medium green (G-3). Retrax temples and lens angle device permit easy adjustment to fit comfortably.

Quality Eye Protective Equipment

Made by the Leaders in Plastics



**WATCHEMOKET OPTICAL CO., INC.**

234 West Exchange St. PROVIDENCE 3, R. I.

In Canada: Lavitt-Safety Limited, Toronto 10, Montreal 26

## Who Pays for Personal Equipment

Company policies regarding personal protective equipment vary rather widely. The cost of goggles is often shared by employee and employer. One recent survey showed that 27 per cent of the companies supplying employees with prescription ground goggles issued them without charge, and 60 per cent assumed part of the cost or made them available at below retail prices.

Few companies furnish safety-toe shoes free. Many of the larger concerns maintain shoe stores for the convenience of employees and make shoes available at or below cost. Others which do not wish to handle shoes make arrangements with local shoe stores to serve employees. Under both plans companies make it possible for shoes to be purchased on a payroll deduction plan.

It is not always easy to decide whether management or the employee should assume the cost of personal protective equipment. Factors are the probability and expected severity of the injury, willingness of workers to wear the equipment, its length of life, and the degree to

which it may be depreciated by non-occupational use.

The welder's helmet, for example, is almost universally supplied by management, since the work could not be carried on without it.

Work gloves, on the other hand, sometimes must be purchased by the user. Welder's gloves, however, are usually considered a necessary part of the job and issued free.

## Training in Use of Respiratory Equipment

Respiratory equipment is often used under conditions of strain and excitement. Those who will have to use it should therefore be trained thoroughly. Regular inspection is also necessary to avoid deterioration of equipment which is seldom used.

The following items of training and maintenance are important:

1. Train each person in putting mask on and adjusting it rapidly to his face.
2. Have each person wear it long enough to become accustomed to the breathing resistance and to putting it on and taking it off.
3. Repeat training at regular intervals.

4. Set up a card for each mask to indicate date of latest inspection and replacement of canister and amount of use, if any, which canister has had.

5. Replace canister at least annually, even if they have not been used.

6. When a canister is replaced, examine facepiece, harness, hose, and headbands for leaks or deterioration. Replace defective parts.

7. Canisters are ordinarily supplied with seals to keep out air until they are placed in service. Remove seals when canister is placed in service.

8. Store mask in a place accessible to hazardous area, and as cool and dry as possible.

9. If mask is for emergency use only, canister should be replaced after use.

## Off-the-Job, Too

Two examples of safety-minded General Motors employees who were saved from disabling injury because they wore protective equipment while working around home are related in a recent issue of *Cadillac Craftsman*.

Leroy Kloss was pulling old nails out of woodwork at his home when a stubborn spike snapped out and

—To page 120



**KLEAR-GLASS PAYS FOR ITSELF  
THE FIRST DAY ON THE JOB**

*No glycerin, silicone or grease*

# PREVENT HUMIDITY FOG-OUT ... man-hour losses

## KLEAR-GLASS®

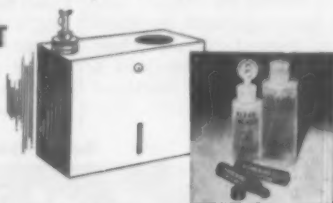
A **double-duty** product that **cleans** as it **defogs**. Immediately following application, protective goggles, masks, and other glass or plastic surfaces will remain **FOG-FREE • STEAM-FREE • DUST RESISTANT • OPTICALLY BRILLIANT**, for several days.

**CHECK THESE FACTUAL FIGURES** — 100 plant workers are required to wear goggles or masks . . . each individual takes 3 minutes per hour for manual defogging . . . this represents a 24 minute time loss per worker during an 8-hour day . . . a total production loss of 2400 minutes — 40 work hours — 5 full work days.

**GREATER PERSONNEL SAFETY TOO**, as workers are not prone to discard protective glasses because of constant fog-up. Unobstructed vision means greater productivity and safety for all.

## SELF-DISPENSING WALL CABINET

ideal for routine service in all plant departments  
ALSO — available as non-drip pocket applicator, and "squeeze bottles" of 1½ and 3½ oz. for quick spray application to truck fleet windshields, windows and mirrors.



**THE BUCKLEY CORPORATION, 507 Fifth Ave., New York 17, N. Y.**

**ORDER TODAY** through your dealer or write direct to Dept. N-1 for prices.

# keep safety glasses **safe**



## keep them **clean**

Implement your Eye Safety Program by helping your employees wipe away their own strongest objection to safety glasses. Quick, easy and inexpensive to use, Sight Saver tissues contain the proper amount of silicone to give longer-lasting clarity and luster to lenses. Specified by hundreds of Safety Directors, Sight Savers are proved by world-wide distribution and repeated use by millions of people.

- Inexpensive to install and maintain
- Foolproof; eliminates waste
- No fuss, no muss, no fluids

**install** **SIGHT SAVERS** **cleaning stations**

See SIGHT SAVERS and SHOE SAVER at our Booth 25,  
New York Safety Convention & Exposition — April 11-15



### SHOE SAVER

Durable, water repellent silicone treatment protects, preserves leather. Shoes last

longer, stay more comfortable. Easy and inexpensive to apply. Improves morale, cuts overhead.

Mail Coupon Today for Distributor Listing

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Please send me your complete listing of sources of supply for SIGHT SAVER Cleaning Stations and SHOE SAVER.

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Readily Available  
from leading Safety Supply Houses

#### SIGHT SAVER DISPENSERS

Cat. No. 60 (Black) No. 61  
(White) No. 62 (Safety Green)  
\$2.50

Refill Packets (Cat. No. 65) \$1.45

#### SHOE SAVER

Cat. No. 81 (Pints, \$2.00, Quarts,  
\$3.75, Gallons, \$12.75) Cat. No.  
82 (4 ounce bottles, \$0.60)

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MIDLAND, MICHIGAN

# STOPS DUSTS Electrostatically

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**dustfoe**  
#**55**  
**RESPIRATOR**



Really tops in dust protection. Lightweight (less than 3 oz.)—engineered for perfect balance. Filter-holder width reduced 50%, eliminating "blind spots." "Static-Web" throw-away filter induces a charge on dust particles—increasing normal filtering action. Aluminum face-piece, rubber cushioned, may be formed to fit any face. Every part replaceable.

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SAFETY  
EQUIPMENT  
TO 1961

—From page 118

flew at his face. If it hadn't struck the lens of the safety glasses he was wearing, it might have lodged in his eyeball.

Kloss, a bug on safety, says he'll wear goggles on any job around the home where his eyes have the slightest chance of getting injured. "What looks like a simple job may have a great potential danger, even if it happens in a freak way," he says.

Safety shoes prevented the other injury. Pete Pell was wearing them while working with some power machinery in his yard. He accidentally stuck his foot in the machine but the steel cap of his shoe took the punishment instead of his toes.

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**sellstrom**  
**safeguards**  
designed  
for  
comfort

**New "Snug" Fiber Glass  
Welding Helmet**



No. 299—About ¾ Size Helmets

This is an entirely new Sellstrom helmet. It is a molded Fiber Glass helmet with round front, closed bottom construction. Instead of the standard 9 inch inside width, this "Snug" helmet is only 7¼" wide, yet large enough to accommodate prescription glasses with plenty of room for abundant air circulation.

Especially recommended for shipyards, bell hole work on pipe lines and wherever welders work in tight places. Now consider these additional advantages:

- 1 Five times stronger than ordinary fiber. Has no grain, therefore no weak spots. Withstands rough treatment.
- 2 Does not transmit heat; keeps welder cool. Will not absorb moisture; keeps shape indefinitely.
- 3 Smooth self-finish in new dark gray color. Does not show ordinary spots.
- 4 Equipped with new, improved Sel-O-Matic ratchet type headgear; has larger, stronger teeth. Easily repaired if necessary; adjustable to fit any head. Standard size Lift Front plate holder. Can also be furnished with, or is interchangeable with, any of the other Sellstrom headgears and plate holders.

Since this is an entirely new "Snug" (small size) welding helmet, ask your dealer to order one or more for you. You can also write us for additional information or request us to forward a sample No. 299 Helmet on memo for test purposes.

Your dealer should soon have a stock of this new "Snug" size Fiber Glass helmet and will be able to supply your regular requirements.

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MANUFACTURING COMPANY

Eye and Face Safeguards Designed for Utmost Comfort  
222 HICKS ROAD, PALATINE, ILLINOIS

National Safety News, March, 1955



## Taconite Project

(From page 7)

receives a membership certificate, lapel pin, wallet card, and a new hat to which is affixed a Turtle Club decal.

Usually, awards are made to a new member by the safety director and members of the management group. Presentations at safety meetings have proved extremely helpful in establishing the importance of head protection.

The Turtle Club was founded by C. R. (Rusty) Rustemeyer, safety director for Canadian Forest Products, Limited, Vancouver, B. C. It was launched by Fleck Brothers, Limited of Vancouver and the international sponsor is E. W. Bullard. Membership applications and copies of the constitution and by-laws are available from Turtle Club headquarters, 275 Eighth Street, San Francisco 3.

Safety orientation of new employees. Each new employee, before going to work, has a complete safety orientation from a representative from the safety department. At that time the employees are issued safety

equipment, and workers are not allowed on the job without proper safety gear. The employees sign a memorandum at the time the equipment is issued, which is returned when the materials have been turned in at the termination of their employment.

A portion of each weekly staff meeting is allotted to the discussion of safety topics. A member of the safety department is on hand to make recommendations and to discuss safety problems with staff members. At these meetings they also learn what future plans are contemplated, so they can anticipate future needs and make their plans accordingly.

Management authorizes regular safety meetings for foremen and supervisors. A representative of the safety department is also on hand at these sessions.

First aid training is given to all supervisory personnel. This includes artificial respiration, application of the tourniquet, splinting, location of pressure points, and other general first aid information.

Tool box meetings are held by the foremen each week, and recommendations of the safety department are discussed with the men on the job.

**Equipment.** Many types of personal safety equipment are furnished to the men. These include hard hats, winter liners, respirators, ear plugs, eye protection, life vests, rain gear and rubber boots, and are issued depending upon the type of work and the temperature conditions.

A hard hat color code has been established so that the various occupations can be easily noted. The color code is as follows:

Red—Powder Men  
White—Laborers  
Blue—Drillers  
Yellow—Carpenters  
Black—Iron Workers  
Grey—Electricians  
Green—Supervisors  
Orange—Pipe Fitters  
Green with Gold stripes—Engineers

**Safety problems.** Because this project includes clearing, tunneling through 1,920 feet of solid rock, the building of bridges and dams, the construction of a 73-mile railroad, blasting, harbor construction, and a great deal of general construction,

—Turn page

# What about him this summer?

## When he sweats it costs you money!



Write today for a  
**FREE SAMPLE  
KOOLPAD.** Costing  
only pennies, StaSafe  
Koolpads can be washed  
in seconds and used  
over and over again.

He wears prescription glasses or goggles. When June, July and August heat hits he stops work frequently . . . removes his glasses . . . takes out a handkerchief . . . mops his brow . . . wipes his glasses . . . replaces his handkerchief . . . puts his glasses back on . . . and finally resumes work. You pay for this brow-mopping . . . at the prevailing wage rate.

StaSafe Koolpads are low cost cellulose sweatbands. They were perfected to do away with most of these production-stopping brow-moppings by absorbing extraordinary quantities of sweat! You save money on every brow-mopping a Koolpad prevents!

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## Taconite Project

—From page 121

the problems encountered by members of the safety department are tremendous. An example is the problem created by the need for dry-drilling the holes for blasting.

Standard safety procedure dictates that when drilling rock, water should be used. Because of the remoteness of this job, and the scarcity of available water, it was impossible to follow this procedure. To protect the men from the dust, the companies purchased respirators which proved to be a satisfactory solution to this hazard. The respirators used are the Bureau of Mines approved dust respirator, Type A.

To further assist in combatting this hazard, the safety department is experimenting with exhausters with flexible metal hose connections to disperse the dust-laden air from four drill machines simultaneously.

It was essential that this problem be overcome, for thus far almost seven million yards of material, about 75 per cent of which has been solid rock, have been moved by drilling and blasting, to make way for the concentrator, pelletizing plant, the harbor, railroad, and ten million gallon reservoir. More than

a million pounds of explosives have been used in the blasting.

**Housing.** The need for living quarters for the men and their families is essential. Virginia and Aurora, Minn., are modern cities, but neither of them is large enough to house the thousands of men pouring into the area. So entire new communities are being constructed. Evergreen Trailer Park consists of barracks for the men without families, and hundreds of new trailers.

In addition to these, the new city of Hoyt Lakes is being built, which already has 200 homes. The city may reach 2,000 homes before the project is completed. Homes, a modern shopping center, fire station and post office are being constructed, also recreational facilities for children and adults. The townsite incorporates the latest city planning measures. Wide streets, proper sewage disposal, parking areas and adequate fire protection are included.

**Fire protection.** Another of the jobs of the safety department is fire protection. Many acres of timber were cleared prior to the actual construction. Close cooperation between the United States Forest Service and

the safety department has thus far led to a good fire-prevention record.

The cold weather may not have too much effect on the men, but it does cause trouble with some materials. To assure the complete drying of the concrete, huge canvas tarpaulins are being used to cover large areas of construction. Forced air heaters and steam boilers, to warm both men and materials, are installed. All canvas is fireproofed prior to use.

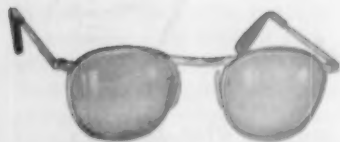
Fire brigades have been established in four areas. Each has its own fire-fighting equipment and fire house, and training sessions are on a weekly basis. At the mill site there is a 500-gallon-per-minute pumper, with an extra 500-gallon water tank. At the harbor there is a 250-gpm pumper, with a 500-gallon water tank. Evergreen Trailer Park has a 500-gpm pumper, and Hoyt Lakes has a 750-gpm pumper. Eventually a majority of the men will have a working knowledge of how to fight fires, as well as how to prevent them.

Safety programs for workers and their families are also part of the job. Both general safety meetings and fire prevention discussions are held in each area. These meetings



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**New Contour-Design  
SPECTACLE-TYPE GOGGLES**

Highly styled to give the appearance of personal glasses, yet ruggedly constructed for complete safety. New L-1 shaped lenses conform to the eye area for greater protection. New full floating rocking nose pads, new skull temples give added comfort. New stronger temple joint. Frames of metal or acetate, in a complete range of lens and bridge sizes. Skull or cable temples available on all frames. Side shields in wire screen, clear or green acetate.



**CUP-TYPE GOGGLES**

A complete variety of styles for chipping, grinding, welding, dust and splash hazard jobs. Designed for maximum eye safety and comfort; exceeds Federal Specifications requirements. Adjustable ball chain nose bridge. Perfect fitting, individually molded left and right eye cups. Over 300 perforations in side shield. Free turning lens ring for easy changing. Wide range of lens types available; precision ground and hardened for optical perfection.



**ADJUSTABLE FACE SHIELDS**

Finest face protection for spot, flash and butt welding, sawing, chemical work, buffing, light grinding, etc. Comfortable headgear design... no "breaking-in." Tough fibre parts are cut on radius to form oval-shaped (not round) natural contours. Adjustment for head size is easily made and stays put, no slipping. "Snap-on" replaceable windows, available in clear or green plastic, or wire screen, in a wide range of sizes and thicknesses.

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are held in the afternoon by the members of the safety department, and by safety committees.

**Modern dispensaries.** The safety department is also concerned with the health of the men and their families. Dispensaries have been established at the mill site and at the harbor. Staffed with registered nurses and physicians, these dispensaries are equipped with all necessary materials to treat major and minor injuries. An ambulance is available at the mill site. Medical service is secured for the project from the East Range Clinic in Virginia, Minn.

**Radio connects the entire job.** Many miles separate the mill site from the harbor. To assure rapid communications on the job, all areas are connected by radio. Supervisors' trucks are in constant contact with their immediate headquarters by short wave radio-telephone. The tugs used to pull the huge floating equipment working at the harbor have ship-to-shore radio phones. Sub-stations are located at Aurora near the mill site, at Murphy City along the railroad, and at Taconite Harbor near Lake Superior. The safety department is in constant touch with each area engineer and each dispensary.

**The safety record.** As of December 31, there have been nearly four million man-hours worked on the Erie Commercial Taconite Project. Though the accident frequency rate is 21.33, the severity rate is only .73. Not a man has been killed on the job, and everything humanly possible is being done to retain this record.

Currently, one-half million man hours are worked each month, and by next summer, it is estimated that this will be increased to a million. This will add new burdens to the safety department, but so did the coming of winter with freezing temperatures and snow and ice. These hazards were solved many weeks prior to their actual need, and the safety department has made plans to assure each new man that his safety is the most important element of this job.

Blasting signals have been established. Before powder men fire, signals are given, so that the men working nearby can be alerted and take cover. It is easy to tell who the powder men are, for they all wear red safety hard hats.

A weekly publication, called *The Rock News*, is given to each man at the time he is paid. This contains information on the safety program.



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OF SAFETY CLOTHING  
AND EQUIPMENT!**

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**Complete Protection . . . . . Full Visibility**  
**High Production Efficiency**

These Safety Hoods have gained world-wide popularity and acceptance among industrial users . . . not only because of their outstanding safety features, but also because of their durability and resiliency. Choice of several styles . . . made in Twill, Vinyl, and single coated rubber over cotton. Provides for constant supply of clean fresh air when needed. Interchangeable or fixed windows. Adjustable to any head size. Pliable, comfortable and all parts easily replaced. The great demand for these particular Safety Hoods and other Wagco products, plus a manufacturing-wise and skilled personnel, enable Wagco to offer the BEST at an interesting low cost.



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We will manufacture to your specifications, or our Safety Specialists will be glad to analyze your Safety problems and make the proper recommendations.

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Home of local dealer and descriptive, illustrated folder on our complete line of Safety Products covering every Safety Need.



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## LOW COST... FACE, HEAD & NECK PROTECTION AGAINST DUST



**\$36.00  
per dozen**

Roomy, comfortable hood protects eyes, ears, nose, throat, and neck against irritating dusts. Weighs only 5 oz. Large picture window, 5½ x 7½, offers full job vision.

**SAMPLE SENT POSTPAID \$3.50**

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**EVERYTHING FOR INDUSTRIAL SAFETY**

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## New SUPERGOOGLES by Jackson

They're wider to allow plenty of inside room for good fit and free up and down movement where today's larger (never wider than  $5\frac{1}{16}$ " ) prescription and safety spectacles are worn.

They're also deeper, to clear the bridge of "horn-rimmed" glasses, somewhat deeper along the temples to afford greater side protection to the eyes, without being bulky.

This width and depth, added only where needed, gives an 18% greater, well ventilated inside area, making the Supergoggles also more comfortable, cooler to wear.

Eye cups are of strong plastic, non-conductive, non-irritating. A large, screen covered vent in each cup prevents fogging. Cups are joined by a metal bar, flexible enough to fit the goggles individually, rigid enough for one-hand positioning. A large leather pad closes in softly around the nose. Lenses, held by threaded plastic retaining rings, are replaced without tools.

### Series '70'

**For Gas Welding, Flame Cutting & Brazing,** types W-70 and WR-70 have 50 mm. lenses, shades 3 thru 6. Baffle plates over vent screens exclude light, flying particles.

**For Chipping and Grinding,** types G-70 and GR-70 have 50 mm. clear, hardened lenses.

**Elastic Headband** holds WR-70, GR-70.

**Plastic Headrest** holds types W-70 and G-70 more firmly. Extruded plastic, impregnable to moisture, holds its shape, is easy to sterilize. Positive locking adjustment has clearly marked hat sizes. Cork-padded sweatband is easy, inexpensive to replace. Adjustable springs, in telescopic arms, hold goggles gently against face.

Series '50' Goggles fit over narrow-frame prescription glasses and safety spectacles

Series '60' Unigoggles fit over the widest prescription and safety glasses now in use



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**OXYGEN** is usually furnished commercially in steel cylinders under about 2,000 pounds pressure at 70 F. Pure oxygen will not burn by itself but it will cause grease or oil in a gauge, gauge line or pipe line to explode.

A compressed gas cylinder can become a jet rocket and tear through brick walls if the cylinder is hit or the valve is broken off. All compressed gas cylinders should be tightly secured.

Acetylene should never be generated inside a building, nor should it be generated, distributed or used in pressure greater than 15 psi. At greater pressures it may become unstable and explode.

Calcium carbide in large amounts is dangerous if not kept dry.

Acetylene cylinders contain 300 cu. ft. of acetylene dissolved in acetone. However, acetylene cylinders are filled with a porous material which is necessary for safe and stable storage of the dissolved acetylene.

All compressed gas cylinders must be secured either in transit or in place. The cylinder should bear the ICC stamp and a date no older than 5 years. It should be examined for leaks.

Most cylinders have fusible safety plugs in the valve. Many of these, including acetylene safety plugs, melt at about the boiling point of water. If the valves become clogged with snow and ice, they should be thawed with warm (not boiling) water applied only to the valve. Never use a flame to thaw the valve.

All liquefied fuel gas cylinders should be stored and used with the valve end up so the gas and not the liquid comes out of the valve. Acetylene cylinder valves must not be opened more than 1½ turns.

Direct flames, sparks, molten metal, excessive heat or electric arcs should never be allowed to contact a compressed gas cylinder.

Flammable gases should be protected from long exposures to hot sun in the summer.

Threads on a regulator should correspond with those on the cylinder valve. Do not force connections that do not fit. Be sure you use the correct regulator. Use regulators and pressure gauges only with gases for which they are designed and intended.

Never attempt to repair or alter cylinders, valves, regulators or attachments. This work must be done by the manufacturer.

—Turn page

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Triple Use  
Respirator**



**for Organic Vapors**—Uses two 85cc absorbent cartridges. BM approval No. 2307. Catalog No. 99.

**for Dust**—Uses two treated wool-felt filter pads. BM approval No. 2167. Catalog No. 96.

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• Contoured, snug fitting, comfortable facepiece. Free-breathing valves. No tool required for changing filters. Economical to use. See your CESCO distributor.

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**PROTECTION**

*without*

**PREMIUM**



• EyeGuard goggles are recognized as the finest made for comfort and protection . . . yet they are priced to save you money! There is an EyeGuard goggle for every requirement in a complete range of styles—cover-all and regular. EyeGuard Goggles for welders, chipper and grinders are made of the finest materials for durability, safety and comfort. They provide all the "wanted" features: Standard 50 mm round lenses, feather-weight rims and side shields, face-shaped contour to fit snugly and comfortably, more ventilation through cup slots—no fogging of lenses.

Compare EyeGuard with any other goggles and prove to yourself that it is possible to get **PREMIUM PROTECTION WITHOUT PAYING A PREMIUM PRICE.**

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### SAVED from Complete Plant Evacuation and Production Shut-Down

- This manufacturer of a chemical product had too many costly experiences resulting from leaks of ammonia and chlorine. It meant complete evacuation of personnel, opening windows to lower gas concentrations and prolonged attempts to fix the leaks by workers wearing inadequate cannister masks. Repair work was painfully slow because repairmen had to make frequent trips to windows for fresh air. It was a costly procedure.

Now — equipped with Scott Air-Paks, repairmen are able to make quick repairs with complete breathing safety. Evacuation of personnel is unnecessary. Result: no lost time — no production losses. The Scott Air-Paks have paid for themselves many times over!

Do you have a similar problem? Then write for the free booklet "Scott Air-Paks Save Money, Man Hours and Men for Industry."

On  
Hazardous Jobs  
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Help Management  
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Breathe Easier



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Canada: Safety Supply Co., Toronto — Branches in principal cities  
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, N. Y.

Test all connections and valves with soapy water before using.

Open cylinder valves slowly.

If there is no valve wheel, the approved wrench or key must be on the valve while the cylinder is in use.

A regulator valve to reduce pressure must always be used.

Before connecting a regulator, crack the cylinder valve slightly to clean the opening of dirt or dust. Be sure to stand aside. But never "crack" hydrogen valves as the chance of ignition is too great.

After the regulator is attached—stand aside and open the valve slowly, as a sudden surge of pressure may damage or blow out the gauge.

Keep oxygen cylinders, gauges and fittings away from oil and grease and do not handle them with oily hands, gloves or clothing.

Never use oxygen as a substitute for compressed air—in breathing apparatus, compressed air hammers or other tools, in burners or engines. In shipbuilding welders have been burned to death when they used compressed oxygen for ventilation in a hold instead of compressed air which they had used previously.

Never fill cylinders or attempt to mix gases in a compressed gas cylinder or use it for any purpose other than those for which it was intended.

Manifolds should be designed and obtained from a listed manufacturer and installed under their supervision.

Only recognized standard regulators should be used.

Regulators are instruments and require care in use and handling. They are worthless if they are not working right.

If a regulator creeps or builds up pressure on the low pressure gauge when the torch is closed, the cylinder valve should be closed and the regulator removed for repairs. If the gauge is not registering pressure properly it should be removed.

All repairs must be done by the manufacturer. The regulator should be tagged and returned to the storeroom.

Hoses for different gases should be different colors with couplings stamped for identification to prevent interchange of connections.

Usually welding and cutting hose connections are marked STD-OXY for the green oxygen hose and STD-ACET for acetylene red hose.

Care must be taken to prevent sparks or slag or flame from hitting hose—and protect hose from being

kinked or run over or caught in a door.

If a flashback occurs and burns in the hose, even briefly, cut off and discard burned hose. Cut off leaking sections of hose; never repair by taping.

Test for leaks by placing hose under water under normal working pressure or turn off torch under normal pressure and watch low pressure gauge at least two minutes for drop in pressure.

A single hose with more than one gas passage must not be used as wall failure would allow the gases to mix in the hoses.

**Explosive limits.** Acetylene's limits are from 2.5 to 80 per cent by volume in air.

Hydrogen: 4 to 84 per cent.

Acetone: 2.5 to 12.8 per cent, with a flash point of 0 F.

Alcohol: Flash point, 48 F. Safer than acetone but methyl alcohol is highly toxic.

Ether: 1.8 to 36 per cent explosive limits; flash point -49 F.

Gasoline: 1 to 6 per cent explosive limit; flash point -50 F.

### Training and Equipment For Maintenance Work

Maintenance crews need thorough training in accident prevention. Their work involves a complex and constantly changing set of conditions rather than a set pattern of activity.

In addition to the regular tools, the maintenance man is concerned with ladders, gloves, masks, goggles, safety shoes, protective hats, safety belts, respirators, rope, chains and other items of equipment.

The training program should include first aid and life-saving techniques. Where irritating, toxic or corrosive dusts, gases, vapors and fluids are present, training should include the characteristics of these substances and methods of controlling hazards.

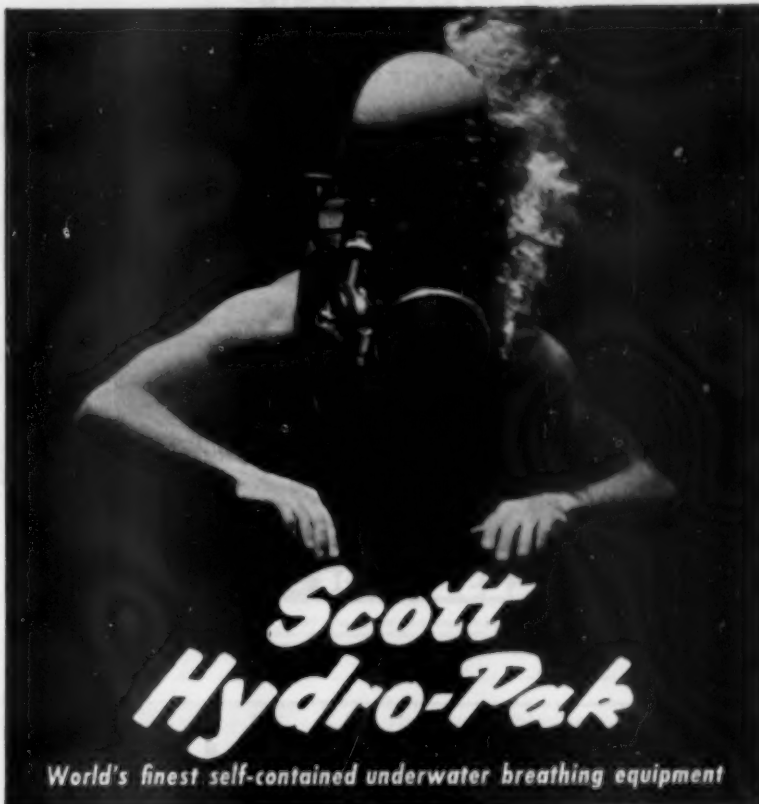
Men must be trained to inspect rope, chains and hoists and to discard items that show excessive wear.

At the start of any job not of a routine nature, the crew should be called together to discuss the problems involved and methods of doing the work safely. If the job is complicated or hazardous, the safety director should assist in the planning.

Scale models may be constructed to determine clearances, methods of moving, and sequences of action.

Tools and tackle should be inspected for wear and defects before

## A new concept of INDUSTRIAL Underwater operation —



**Scott Hydro-Pak**

World's finest self-contained underwater breathing equipment

### For underwater inspection, salvage, repair, research

- If your company has ever hired professional divers to act as the underwater eyes and hands of your skilled engineers and technicians you know how costly and unsatisfactory this indirect method can be.

Now, the Scott Hydro-Pak makes the underwater aspect of the job secondary. After proper instruction, almost any physically fit engineer or technician can do underwater work in perfect comfort and safety. The job is done better, faster and at dramatic savings in cost.

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Wear them over all modern glasses. Wide surface contoured edges eliminate nose pressure, seal out flying particles. Change the 50 mm Super-Safety lenses from front, quickly. Well-ventilated to reduce fogging. Comfort-King headband is easy to adjust; can't snag hair; won't kink or curl; requires 30% less tension.

See your CESCO distributor about the 548-C and many other CESCO safety goggles and glasses. There are types for every job.

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use. When special tools can be designed to make a job safer, the engineering department should be consulted for design and specifications.

### Women on the Job —From page 11

in part to the physical differences in men and women. These differences are not always taken into account when operations are set up and guards are adjusted for the latter. Frequent injuries occur in connection with punch presses, power cutting, and sewing and knitting machines.

When women are placed in machine jobs ordinarily done by men, it is important that adjustments be made at all points of operation. Guards should be set close enough that women's smaller hands cannot enter the openings.

Height of benches, distances away from piece parts, and foot pedals or hand controls should be reset to conform to the generally shorter stature and reach of women.

Injuries sometimes result because personal protective equipment for women is neglected. Women require the same safety features in protective clothing and equipment as men, but greater attention to appearance is important, as many women will resist the use of garments that are "unflattering."

Although this may seem mere vanity, it cannot be ignored. Suppliers recognize this and offer safety clothing and equipment styled so it will be acceptable to women.

Work clothing for women should be comfortable and appropriate to the job and, wherever possible, attractive. Suitable dresses, uniforms and smocks are available and, where skirts are a hazard, slacks and coveralls are used.

Women's work shoes should conform to standards that apply to men—adequate in weight, comfortable and well-fitting—and should be equipped with steel toes where hazards so indicate. High heels on the job should be discouraged, since women usually are more susceptible to falls than men.

### Safety Rules

Two hazards peculiar to women are to be considered where moving machinery is involved—the wearing of jewelry, and loose, flowing hair. These are overcome by the use of hair nets or caps, and by enforcing a rule that no jewelry can be worn on the job.

—To page 130

## No Time Wasted!

WHEN WORKERS WEAR

STASAFE

## WINDSOCKS

The Safety Hat Liners  
That Need No Installation

9" length \$2.64 Doz.

11" length \$3.00 doz.



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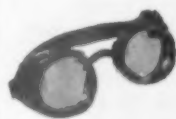
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safety**

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Does the equipment you have give the best available protection in each particular danger spot?

Safety allows no room for Achilles' heels. That's why PULMOSAN makes many hundreds of items of protective equipment of *all* types. In one of the PULMOSAN catalogs, you can be sure of finding the equipment that is specifically designed to cover each of your safety needs.

Experienced in selecting the correct equipment for the job, PULMOSAN offers you expert assistance in reviewing your safety needs. Your inquiries are invited.

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No. 100  
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- CESCO No. 100 Chemical Goggles are a must for workers in dusty air or near splashing liquids. Ask your CESCO distributor about them.

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## Women on the Job

—From page 128

Stature and strength of women must be considered when jobs are assigned and work operations are laid out.

Particular attention should be paid to lifting. Women should be trained in proper lifting methods, just as men workers are, and their limitations must be remembered.

Many changes in work operations to prevent fatigue for women workers have proved doubly profitable because of increased efficiency. Re-designing job methods to permit sitting in a rubber products plant operation enabled 16 girls to do the work formerly done by 20.

An aircraft plant suspended an air-operated wrench, too heavy for a woman to lift, and she found she could then operate two simultaneously, instead of one handled previously by a man.

Sanitary facilities are important to the morale of women workers. Properly equipped rest rooms, toilets and showers are necessary to their comfort and health. And of course, mirrors must not be overlooked.

## Work and Pregnancy

With many married women at work, the effect of work on pregnancy is receiving much consideration. The problem also involves questions of social adjustment. Individual cases may need specific advice and treatment.

In general, it is not considered desirable to employ women in occupations that involve heavy lifting and other strenuous work, or continuous standing or moving about.

Occupations involving exposure to toxic materials are also considered extra hazardous during pregnancy. Work with serious injury hazards and jobs that require a good sense of bodily balance should be avoided.

## REFERENCES

The Woman on the Job—National Safety Council, 1954. Contains extensive bibliography and summary of state laws concerning employment of women).

Women in Industry, Their Health and Efficiency—A. M. Baetjer; W. B. Saunders Co., Philadelphia, 1946.

Women at Work—Bulletin No. 161, Women's Bureau, U. S. Department of Labor, Government Printing Office, Washington, D. C.

Handbook of Facts on Women Workers—Bulletin No. 242, Women's Bureau, U. S. Department of Labor, Government Printing Office, Washington, D. C.

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with lower bib  
curving inward.



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Designed, for over 30 years, with the welder in mind, Dockson Helmets incorporate these safety-comfort features: adjustable, cushioned headgear; form-fitting chin rests; spring pivot to hold shield in any position and allow easy raising and lowering.

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Cap and helmet  
—for use where  
falling objects  
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piece extends  
straight down-  
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Herculite con-  
struction—mois-  
ture-proof, non-  
warping, light-  
weight.



No. 1525

Handshield—of  
the Herculite  
construction.

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C O R P O R A T I O N

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## The Accident Price List

**TIME CHARGES** used in reporting accident experience to the National Safety Council for contest and record purposes are listed in the following table. This table conforms to the definitions specified in *American Standard Method of Compiling Industrial Injuries Z 16.1*:

**Fatality**—6,000 days

### Arm

Any point above\* elbow, including shoulder joint—4,500 days.

Any point above wrist and at or below elbow—3,600 days.

### Hand

At or below wrist and above proximal joints of fingers—3,000 days.

### Thumb

At or below (toward tip) proximal joint, and above distal joint—600 days.

At or below distal joint—300 days.

### Leg

Any point above\* knee—4,500 days.

Any point above ankle and at or below knee—3,000 days.

### Foot

At ankle and above\* proximal joint of toes—2,400 days.

### Great Toe

Above distal joint up to and including proximal joint—300 days.

At or below distal joint—150 days.

Two great toes—600 days.

Each toe other than great toe: complete—150 days.

less than complete—75 days.

### One Eye

Loss of sight—1,800 days.

### One Ear

Loss of hearing—600 days.

### Both Ears

Loss of hearing—3,000 days.

### More Than One Finger of Same Hand

Two fingers—750 days.

Three fingers—1,200 days.

\*The term "above" when applied to arm, hand or fingers means "toward shoulder;" when applied to leg, foot or toes means "toward hip."

Four fingers—1,800 days.

Thumb and one finger—1,200 days.

Thumb and two fingers—1,500 days.

Thumb and three fingers—2,000 days.

Thumb and four fingers—2,400 days.

### Finger, Except Thumb

At or above middle joint, up to and including proximal joint—300 days.

At or above distal joint, up to and not including middle joint—150 days.

Below distal joint, provided bone is damaged—75 days.

Tip, without either traumatic or surgical bone involvement—Actual days of disability if any.

### Permanent Total Disability

3.3.2. The loss of, or the complete loss of use of, any of the following in one accident shall be considered permanent total disability:

(a) Both eyes;

(b) One eye and one hand, or arm, or leg, or foot;

(c) Any two of the following not on the same limb: Hand, arm, foot, or leg.

# CESCO

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### NOW... an Air-Conditioned Grinding Hood



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No.  
10256**

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When the LIFE of Your  
Employee is at Stake . . .

## MINUTES COUNT

Emergencies where respiration  
is involved need INSTANT  
action

Then—you NEED the



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Three machines in one  
RESUSCITATOR • INHALATOR  
ASPIRATOR

Write today for demonstration with-  
out obligation or for pamphlet N-103.





**Temporary Total Disability**

3.4.1. An injury which does not result in death or permanent impairment shall be classified as a temporary total disability if the injured person, because of his injury, is unable to perform a regularly established job, which is open and available to him, during the entire time interval corresponding to the hours of his regular shift on any one or more days (including Sundays, days off, or plant shutdowns) subsequent to the date of injury.

**Temporary Partial Disability**

3.4.2. A regularly established job is one which has not been established especially to accommodate the injured employee, either for therapeutic reasons or to avoid counting the case as a temporary total disability. If the injured person is returned to a regular established job other than his own, the injury shall be classified as a temporary partial disability. See 3.5, Page 7. Z-16.1 Bulletin.

Flammable liquid should not be emptied into drains or sewers. A serious explosion could occur if the vapors were ignited.



*For Safety*  
**Guard-Ann Hat**  
U.S. PATENT NO. 2,808,000

Combines utmost protection and style. Exclusive patented features found in no other hat.

**Write for Free Sample or Order Direct from us**

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BUFFALO 11, N. Y.

**Wage Earners Are Living Longer**

According to the mortality in 1954, the average length of life of America's wage-earners and their families climbed to within a tenth of a year of the Biblical three score years and ten, statisticians of the Metropolitan Life Insurance Company report.

This record is derived from the experience among the Metropolitan's industrial policyholders. The average length of life (expectation of life at birth) of these insured persons is now 69.9 years, the statisticians said.

The current figure is one year greater than that for 1953, and five and one-half years above that of a decade ago. Improvement has been more rapid for industrial policyholders than for the general population of the United States, the statisticians noted. In 1911-12 the average length of life among these insured was only 46.6 years, or about six and one-half years less than that for the population as a whole; at present the two are on a par.

**Waterproof Covers**

Waterproof covers are often needed to protect material and equipment against water damage in case of fire. They are also useful for other emergencies, such as breaks in piping or when rain enters through broken windows or torn roofing during a windstorm.

Waterproof covers are especially useful in buildings where machinery, equipment or stock is readily damaged by water. This includes textiles, paper goods, hardware, foodstuffs, dry chemicals, department stores, leather goods, furniture, and other high-value materials. Areas in multi-story buildings where floor leakage is likely should have waterproof covers.

Approved covers are made of rubber-coated or chemically-treated water-resistant canvas. They come in sizes up to 24 by 36 feet. They will last for years if stored away from heat. They should be refolded regularly to prevent cracking along the folds.

Covers of vinyl plastic sheeting are used for some purposes. These covers are non-conductors of electricity and transparent enough for visibility of work being done. They are sometimes used by public utility companies for protecting linemen's repair work. They are also used for covering boats and trucks and for other specialized uses.

Watchmen and responsible plant employees on all shifts should be instructed in prompt use of covers.

**NO-FOG Lens Cleaning Tissues**

**USE JUST WATER  
NO CHEMICALS NEEDED**

4 Boxes—1000 Tissues Each  
Size 4½" x 10½"—\$7.00



Complete with  
Bottle & Sprayer  
Price — \$5.45

This new, chemically treated tissue is low in price and does away with expensive chemical sprays.

Cleanse and no-fogs goggles, eyeglasses and welding lenses with the addition of water only.

Tissues can be used several times.

Contact your nearest jobber or write us for samples and literature.

Distributors wanted. Write for proposition.

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**ACME... the only Gas Mask With the "PICTURE WINDOWS"**

You never have that "jammed-in" feeling, wearing the Acme Full-Vision Gas Mask. Its patented, larger lenses are like picture windows, giving you full natural vision for that safe, unconfined feeling. When you walk, you can actually see your toes without bobbing your head. This factor alone makes Acme outstanding among gas masks... well worth looking into.

Write for the complete story on Acme Gas Masks for all occupational hazards.

**ACME PROTECTION EQUIPMENT COMPANY**

Manufacturers of Acme Full-Vision Gas Masks  
1209 Kalamazoo Street, South Haven, Mich.

## PERSONAL PROTECTION—PART II

**E**VERY part of the human body figures in the accident statistics, and, significantly, parts for which protection is most widely used account for low percentages both of the total number of disabling injuries and the total amount of compensation.

The record for eyes saved in industry through safety glasses and shields is well known. For parts of the body below the neck, the toes account for a surprisingly small percentage of both cases and compensation. Toes, according to most recent surveys, are involved in only 4 per cent of disabling work injuries and 2 per cent of the total compensation paid. Publicity in employee publications about feet saved through wearing safety shoes indicates that this form of protection has been profitable for both employees and employers.

For the other parts of the body, protection is much more difficult. Unlike the toes, fingers cannot be encased in steel while doing the work expected of them. Finger injuries comprise 16 per cent of the injuries and 13 per cent of the compensation.

The trunk, which includes the vulnerable spine, contributed 27 per cent of the injuries and 28 per cent of the compensation.

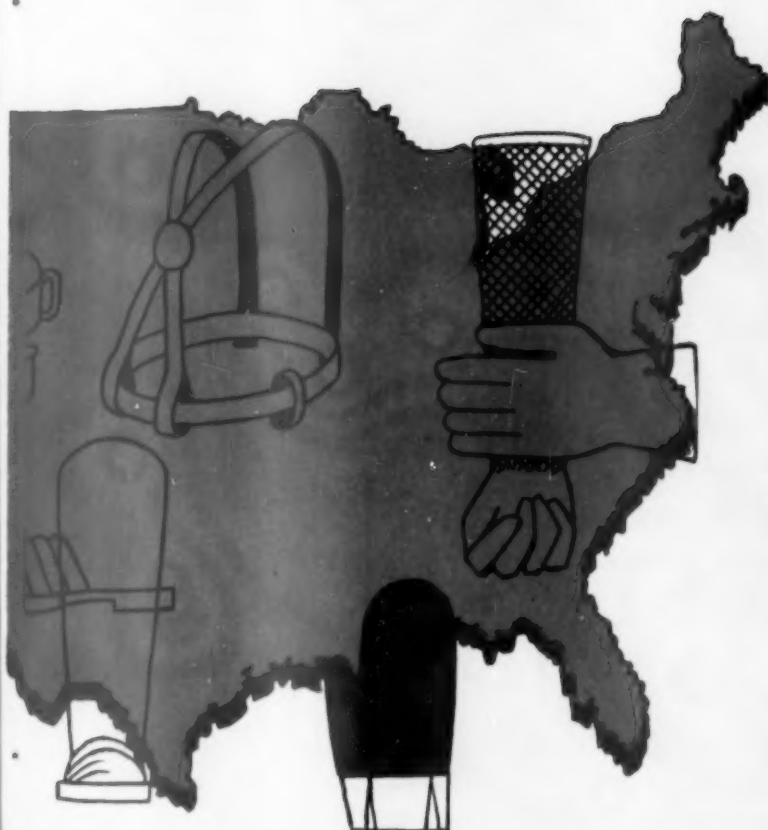
For the legs, the percentage was 12 for cases and the same for compensation.

For hands, it was 9 and 6, and for feet, it was 8 and 6.

The prevalence of injuries to any part of the body calls for a study of both work methods and the protection offered by available items of personal protection.



## PERSONAL PROTECTION Part 2



6

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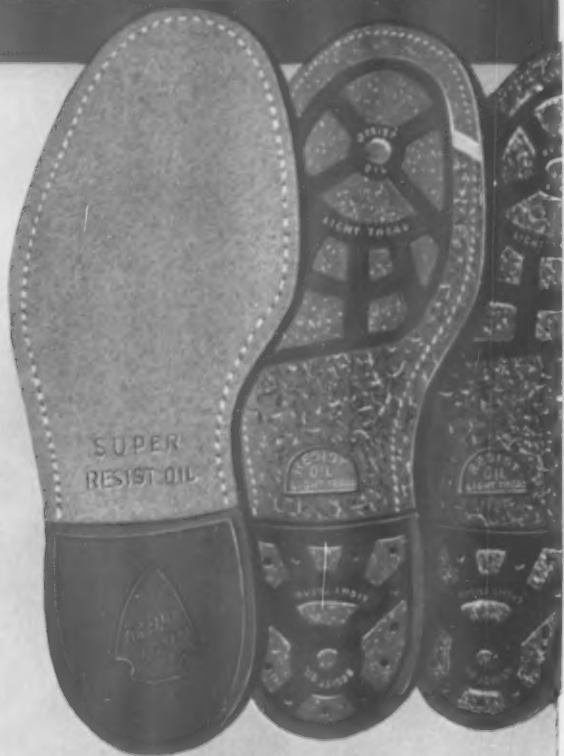
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**HY-TEST**

*Safety Shoes*

*Wear  
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**HY-TEST'S *NEW*  
SUPER RESIST-OIL SOLE**  
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ion with Metatarsal Pad  
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stitched.

H504...Brown Three-Eyelet  
Low Oxford  
New Shrunk Leather  
upper; natural Super Re-  
sist-Oil sole, brown half  
rubber heel.



H204...Maple Moccasin  
Type Oxford  
New Shrunk Leather  
upper; natural Super Re-  
sist-Oil sole, brown half  
rubber heel.



More than 84 different styles available!

.....for **EVERY** Job in Industry!

# FOOT PROTECTION



Women need safety shoes for many occupations. They are more critical of appearance than men but comfort and good fitting are important for both.

**FOOTWEAR** for the industrial worker must protect the feet against moisture and hot substances, rough surfaces and sharp objects underfoot, and falling objects. Shoes must be durable, properly fitted and comfortable. Industrial safety shoes meet these requirements.

**Footguards** of high-strength steel, supplementing safety shoes for more severe exposures, protect the instep as well as the toes.

**Safety shoes.** As generally used, the term means shoes with reinforced toecaps. These are available in a variety of constructions and styles for men and women.

Steel toecaps are specified for most occupations because of their ability to resist heavy blows.

Fiber and plastic are used for shoes worn around electric equipment where insulation is more important than resistance to impact.

**Standards.** American War Standards, Z41 Series, of the American Standards Association, are still the accepted guide for purchasers of safety shoes for men and women.

Specifications call for a well-constructed, durable work shoe with the toe reinforced with a steel cap. The cap is supported on a flange resting on the sole. It must support a static load of 2500 pounds and resist the impact of a 50-pound weight dropped one foot. When subjected to either

test, the inside of the toecap must not come closer than one-half inch from the upper surface of the sole.

Strength requirements for shoes for both men and women are identical.

Shoes meeting these requirements bear an identification stamp on one shoe of each pair. The stamp indicates the type of shoe according to the code classification.

## Distribution

To secure acceptance of foot protection, safety shoes must be comfortable and properly fitted.

Purchasing must also be made convenient.

Many of the larger companies maintain well equipped stores with a wide range of lasts and sizes and trained attendants to fit the shoes. Shoes are sold at cost and employees may buy them on the payroll deduction plan. Safety shoes are sometimes awarded as contest prizes.

Smaller plants are not always in a position to stock an adequate range of sizes or provide expert fitting service. Many companies have made arrangements with local shoe dealers whereby employees may purchase shoes through payroll deduction.

A mobile shoe service is offered by dealers in some areas. A truck equipped as a shoe store is manned by an experienced fitter who is responsible for all adjustments. A variety of styles and full range of sizes are carried. Periodic visits are arranged and between visits shoes can be obtained quickly on special order.

This service is rendered on a moderate mark-up basis and the plant can charge the employee any part of the cost.

It is desirable for a worker to have more than one pair of safety shoes so they can be rotated. Shoes will last longer and be easier on the feet. The wearer will also have a pair available while the other is being repaired.

Many companies encourage purchase of safety shoes for wear off the job. They know that the buyer's feet will be protected when the shoes end their days on the job.

**Records** for each employee should be kept. A 3 x 5 inch card shows name, department, payroll number,



This trailer is a safety shoe store on wheels. It makes the rounds of the scattered operations of a large steel mill.



Types of industrial footwear: Spats, rubber boots, wooden soled shoes, women's safety shoes, wooden sandals worn over shoes on hot surfaces, men's steel-toe shoes.

and details of each transaction. These include date, stock number, size, width, price, and payment. The reverse side of the card carries such information as history, details of foot trouble, and other comments.

### Types of Shoes

**Safety shoes**, generally, are well made on lasts designed for comfort. They are available in many types and styles, some suitable for street wear. The protective toecap does not add appreciably to the weight or cost of the shoe.

**General purpose shoe.** The most widely used type is the blucher, in high cut or oxford styles. It is available in a wide range of sizes, widths and lasts, ranging from rugged, heavy-duty styles to those suitable for street wear. It is the basic type, with certain differences in detail for special occupations.

**Foundry shoes.** An early type of safety shoe still in use is the foundry shoe with elastic panels at the sides. There is no opening on the instep where molten metal or hot sand can penetrate and the shoe can be pulled off quickly in an emergency. This model is furnished with steel box toe.

**Spark-proof shoes.** Shoes with brass hooks and eyelets and brass nailed heels are worn in some industries where sparks from iron or steel might ignite flammable gases.

**Shock-resisting shoes.** Some are non-metallic with fiber box toes;

others have steel box toes which are partially insulated. These shoes are designed for work around electric current. They are also worn by those handling flammable materials, by workers in explosives plants, and in grain products refining operations.

**Conductive shoes** are designed to drain off static charges prevent their building up in the body to the point where they could cause a spark.

The conductivity of these shoes is affected by other conditions. Wool, natural silk and nylon socks act as insulators to the body; cotton, lisle or rayon are satisfactory. Foot powder also serves as an insulator. The floor as well as the shoes must be a conductor.



Heavy leather gloves and apron and foot guards are worn for handling castings.

**Rubber footwear.** Where work must be done in deep mud or in water, rubber boots contribute to health, comfort and safety. Rubber boots are available with steel box toes.

### Soles and Heels

**Leather** is comfortable and durable for normal conditions. Oak leather will not give satisfactory service where heat is excessive or where the shoe is subjected to continuous dampness. Chrome tanned leather is more resistant to heat.

**Rubber** is resistant to moisture, alkalis and most acids. It deteriorates quickly when exposed to grease, oil, solvents, some acids, or excessive heat.

**Neoprene** resists moisture, also grease, oil and solvents that would ruin rubber. It stands up well against cutting and abrasion.

**Cord soles** and heels of rubber or neoprene, similar in construction to automobile tires give good traction under severe conditions for many operations.

**Cork** blended with the rubber or neoprene is an excellent material. Slip resistance is good and the soles are light and flexible. Cork also helps to insulate the feet against heat or cold.

**Wood soles** are used for extreme conditions of heat, dampness, oil, acids or caustics underfoot. They are popular in steel mills, foundries, and other hot operations. They also afford protection against nails, broken glass, scrap metal, and other sharp objects.

Wooden-soled shoes can be obtained with steel toecaps or with guards which cover toes and insteps.

### Foot Guards

Where unusually heavy objects are handled, feet may need more protection than shoes with reinforced toes. For such work, there are foot guards of heavy gauge, flanged and corrugated metal.

The guards are strapped on over the shoes and protect the instep as well as the toes.

With the flange resting on a firm floor surface, foot guards should stand an impact of at least 300 foot-pounds without being dented sufficiently to damage the shoe underneath or injure the foot.

Foot guards are also made with soles of rubber or calked steel to minimize slipping hazards.

Combination shin-foot guards, with an aluminum alloy shin protector hinged to the foot guard, are available.

Thom McAn  
SAFETY SHOES

**ALWAYS  
A STEP AHEAD  
IN SAFETY**

*Performance*



the McCoy  
SAFETY TOE

BERCON FALLS  
RUBBER  
FOOTWEAR

LEHIGH  
SAFETY SHOE  
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Charles  
CHESTER  
AIR CUSHION SHOES

KNAPP  
SAF-TEST  
SAFETY SHOES

Iron  
Age



**SAFETY BOX TOE COMPANY**





We are proud of our progressive  
colleagues in the field of safety footwear.

It is their applied experience, imagination and  
technical facilities that have produced *the* shoe for  
performance in each particular foot hazard. We are proud,  
too, that we can supply them with 19 styles of precision-built,  
*austempered* steel toes from which to choose. WINGUARDS,  
of course, are still the popular choice.

### SEE US AT BOOTH 5

Greater New York Safety Council  
25th ANNUAL

Safety Convention and Exposition  
April 11, 12, 13, 14, 15, 1955



812 STATLER BUILDING • BOSTON

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CANADA

EDWARD LUNDQVIST, TIBRO, SWEDEN

# SAFETY CLOTHING



Displays showing the various types of protective equipment used in the plant are effective in promoting its use.

**SAFE CLOTHING** may be any type of clothing that is clean, in good repair and suitable for the job. Most garments offer some protection against minor hazards.

**Safety** clothing refers to specific garments designed for certain hazardous jobs where ordinary work clothes do not provide sufficient protection.

Specific hazards involving the use of protective garments include: Hot metal splashes, hot sparks, as in welding, flying objects, as in fighting fires of extreme heat, as in tapping furnaces; shoulder bruises from carrying heavy loads; splashing alkalis, acids, etc. A wide variety of protective clothing to meet these is commercially available.

Proper fitting is essential in all work clothing. Long, loose sleeves and neckties may get caught in machinery. Trousers cuffs may cause tripping.

Clothing soaked in oil or flammable solvent is ignited easily. Both flammable and non-flammable solvents may cause skin irritation. Cleanliness is also an important aid to morale.

Laundered overalls, coveralls, aprons, smocks and other garments are furnished by companies for occupations where extreme cleanliness

is necessary because of the product or because of health-hazardous processes.

Exposures that require special protective garments include moisture, high temperatures, hot or corrosive substances, flying particles, sharp or rough edges, etc.

See chart on page 166 for types of garments and materials for various hazards.

The following are essential in all work clothes:

1. Adequate protection.
2. Comfort and freedom of movement.
3. Durability.
4. Appearance.

Appearance of clothing is particularly important with women employees but men are not indifferent to it.

**Standards.** Specifications established by the Federal Government have provided widely used standards for many years. During the war the American Standards Association approved a series of War Standards for Protective Occupational Clothing—Series L18. These are still accepted standards.

Specifications cover protection against sparks, molten metal, infrared and ultra-violet rays, and limit-

ed impact forces. Details of pattern, design, workmanship and range of sizes are also included.

**Asbestos** has long been used for protection against intense heat and flame. Many garments are made of this material, including complete suits for fire-fighting and rescue work.

Wool clothing should be worn under asbestos garments where intense heat is encountered.

**Reflective material**, such as aluminum foil, is used with insulation material to provide a radiation barrier as well as to protect the wearer against conductive heat. Originally developed by the U. S. Air Force for fire-fighting and crash rescue work, these suits have found uses in industry and are available commercially.

**Leather** of various grades is used for protective garments. Chrometanned leather affords protection from sparks, molten metal splashes, and infra-red and ultra-violet rays. Leather, however, deteriorates under continued exposure to heat. For severe exposure, asbestos should be used.

Leather provides protection against limited impact. Padded leather or fabric aprons and hard fiber or metal protectors for the abdomen absorb much of the force of hard blows.

—To page 168



Garments of aluminized material afford worker greater protection against radiant heat as high as 2500 F. Combination above consists of face shield with copper coated protective glasses, elasticized sleeves, gloves, apron and leggings for heat reflection at floor level. (Far-Ex Corp.)

# JAXCOLITE\*

**NOW STEEL-GRIP PRESENTS A LINE  
OF SAFETY APPAREL MADE OF AN**

**AMAZING NEW MATERIAL**

**JAXCOLITE COMBINES EXTREME  
RESISTANCE TO CHEMICALS, BURN, HEAT  
AND WEAR WITH COMFORT, FLEXIBILITY,  
APPEARANCE AND LOW COST**

No safety apparel has ever given us greater satisfaction to present to industry than Steel-Grip garments made of Jaxcolite. Jaxcolite is a new yet tested and proved compound, applied as a coating to a duck, asbestos or burlap base. Wherever safety apparel made of this new material has been used, it becomes firmly entrenched. There is nothing to compare with it. Jaxcolite garments combine every feature you could want.

\* A Product of Jaxind, Inc.



**SLEEVES • COATS • APRONS  
LEGGINGS • SPATS • PANTS  
GLOVE AND MITT BACKS MADE OF  
JAXCOLITE DUCK OR ASBESTOS.**

**WELDING CURTAINS AND APRONS  
OF JAXCOLITE BURLAP**

- 1 They are extremely resistant to molten metal splash, acids, caustics, water, oil, heat and wear.**
- 2 Jaxcolite garments are lightweight, flexible, attractive in appearance.**
- 3 The cost is very low.**

We do not hesitate to urge you to act at once. Send now for sample materials or safety apparel made of Jaxcolite. You will be amazed at the advantages presented.

## ANOTHER FIRST

**by Steel-Grip** CERTIFIED

**ASBESTOS SAFEGUARDS**

**THAT MEET OR EXCEED RIGID  
SPECIFICATIONS. THE CERTI-**

**FIED STEEL-GRIP LABEL  
IS YOUR GUARANTEE.**

**INSIST ON IT!**



All Steel-Grip Certified Asbestos Safeguards meet or exceed specifications shown on label at left. Your only protection against inferior cloth.

As every experienced safety clothing buyer knows, there are various grades and weights of asbestos cloth. Some are low in asbestos content, contain highly combustible organic binder, are weak in yarn tensile strengths, low in warp and woof counts. Only laboratory tests can determine the true factors.

However, Steel-Grip Industrial has established rigid specifications and laboratory tests of raw materials, and is the first to "quality-control" these raw materials. A certified Steel-Grip label attached to each asbestos safeguard we manufacture is your guarantee against the purchase of inferior products. This label is your protection. Insist on it. The first cost is not the end cost. Quality asbestos is always the "cheapest." Prove this to yourself. Put Steel-Grip Certified Asbestos on the job and get the lowest man hour cost for protection.

### INDUSTRIAL GLOVES COMPANY

A Corporation

**1702 GARFIELD ST.,  
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(In Canada:

Safety Supply Co., Toronto)

**TO BE SURE OF THE GENUINE  
DEMAND THIS TRADE MARK**



**SEE THESE PRODUCTS  
AT THE NEW YORK  
SAFETY SHOW  
BOOTHS 9, 10  
AND 11**



# We Are Shoe Makers

Only the finest,  
nationally  
advertised soles  
are used on  
**Iron Age  
Safety Shoes**

The Safety Shoe



For Industrial America



No. 620

**SEIBERLING OIL-PRUF SOLES**—The first oil-resistant soling material that will also withstand dry abrasion. A brown sole that wears better than black. An ideal sole for those walking in and out of oily surroundings. Made by SEIBERLING RUBBER COMPANY.



No. 626

**"LEATHERPLUS" SOLES**—A premium all-leather sole, cut from the heart of the hide. Patented tannage by VAN TASSEL LEATHER COMPANY imparts more durability and flexibility than ordinary oak leather. Wearers enjoy greater comfort, double the sole life.



No. 636

**NEO-CORD SOLES**—Made by GRO-CORD RUBBER COMPANY to resist oil—heat—acids and caustics. In this sole Neoprene and cord are combined in the famous multiangle process. Has high slip-resisting factor, long wearing characteristics.

# Iron Age



# .....Not Sole Makers!

**NAMES YOU CAN TRUST**—Our aim is to turn out the finest, longest wearing safety shoes it is possible to make. To this end we buy and use only the best materials. Leathers, steel toe caps, linings, threads—even laces must measure up to the highest standards. We don't subscribe to cost cutting and quality impairing practices such as making our own outsoles.

Sole making, like shoe making is a specialized business. The manufacturers from whom we buy our soles stake their reputation on the wearing quality of their products. They advertise nationally. Collectively they provide us with the best obtainable selection of soling materials for the underfoot conditions involved.

"Name brand" soles are just another good reason why Iron Age offers you the greatest value in safety shoes. They assure you and your workers of more foot miles of safe, comfortable shoe life.

**Iron Age Division - H. Childs & Co., Inc.**

Pittsburgh 12, Pa.



No. 625

**BEARFOOT NEOPRENE CREPE SOLES**—Made from type "S" Neoprene by THE BEARFOOT SOLE COMPANY, INC. to provide a thick, comfortable sole that insulates against heat, is oil-resistant, prevents slipping and wears twice as long as ordinary crepe.

## Safety Shoes

National Safety News, March, 1955



No. 623

**VUL-CORK MICRO-CELL CUSHION**

**NEOPRENE SOLES**—Cellular construction of this flexible, Neoprene cork sole permits a 40% reduction in weight. Extremely slip-resisting. Non-absorbent. Resists oils and caustics. Made by CAMBRIDGE RUBBER COMPANY.



No. 679

**BILTRITE NEOPRENE "GREEN PLUG" SOLES**—A "sure step" work sole by AMERICAN BILTRITE RUBBER COMPANY made from a firm, long-wearing compound that resists oil, grease, chemicals and acids. Green, non-slip plugs assure maximum safety.

# SAFETY BELTS AND HARNESS

**WORK** at high levels, in closed spaces where the air may be irrespirable, or where there is danger of being buried by slides of loose material, requires the use of safety belts and harness with life lines.

Occupations in which safety belts are used routinely or occasionally include: window cleaners, structural steel and bridge workers, cranimen, shipbuilders, forestry workers, miners, mechanics, painters, workers entering tanks, bins and underground passages and linemen.

In selecting equipment, two types of use must be considered—"normal" and emergency.

Normal use involves comparatively light stresses applied during regular work. These stresses rarely exceed the static weight of the user.

Emergency use means stopping a man when he falls. This may subject every part of the belt to an impact loading many times the weight of the wearer.

## Types of Equipment

Several types of belt and harness have been developed for various occupations. Most familiar of these are the lineman's belt and safety strap and the window cleaner's belt.

Belts of these types are built for extra severe use. Belting material and hardware have both received much study. The belts are usually serially numbered and dated so that records of age and condition may be kept.

For many occupations a lighter belt will provide ample protection against falls. These may be of the simple body type or the harness type. Both have dees to which a lanyard is attached. The harness type distributes the shock over the shoulders, back and waist instead of concentrating it at the waist.

**Body harness** with lanyard attached worn by workers in certain locations expedites their rescue if they should be overcome by gas or vapors, buried by falls of loose materials or injured in confined spaces.

Wherever the work requires a supplied-air respirator, harness and life line rather than a belt should also be used.

If long free falls are possible, the harness should be designed to distribute the impact force over the legs and chest as well as the waist.

The longer the free fall, the greater the impact force exerted

upon harness and lanyard. It is therefore advisable to tie off the line as short as movements of the worker will permit.

**Boatswain's chair.** Where a belt must support the entire weight of a man while he works, as in raising and lowering him along the wall of a building, a boatswain's swing chair should be used. In this type of belt, one strap is used as a seat, sometimes with a board to make it more comfortable. Attached to the seat strap at each side is a strap around the waist to prevent him falling out of the seat. The waist strap permits the wearer to stand or sit.

**Materials.** Leather and cotton or linen webbing belts are furnished by most manufacturers.

Well tanned and well oiled leather resists most chemicals but it should not be left in contact with them. Regular cleaning after use is important.

Leather  $\frac{1}{4}$  inch thick and  $1\frac{1}{2}$  inches wide will have an ultimate strength of about 500 pounds. This is adequate for lifting a man out of a tank or bin.

Webbing will stand more heat than leather, and when soaked in water will dry out in its natural condition. Friction buckles can be used with webbing, avoiding the loss of strength at buckle holes.

Belts intended to check a fall demand strength proportionate to the possible distance of fall and weight of body. A 2" by  $\frac{1}{4}$ " leather belt would probably arrest the fall of a



Without his safety belt, this blast-furnace rigger would have dropped 60 feet. He was working on top of a blast furnace gas washer that was being dismantled when a rusted structural member collapsed beneath him. (Mine Safety Appliances Co.)

window washer at 6 feet. It might break at a 10-foot fall.

For a comfortable margin of safety, a window cleaner's leather belt should be at least 3" by  $\frac{1}{4}$ ", or the equivalent.

Special types of webbing are available for certain uses. It can be treated to resist paint and mildew. For the chemical and petroleum industries webbing impregnated with neoprene resists acid conditions.

**Quick release** from a safety belt may be desirable in case of fire. Petroleum workers, for instance, use belts with a quick release buckle which can be disengaged instantly by a single motion of the hand.

Belts for some occupations contain loops and pockets for light tools.

**Collapsible canvas tool buckets** are also needed on some jobs so the worker may have his hands free while climbing. Edge tools should be protected by guards while being carried.

**Shock absorbers** incorporated in harness and lanyards reduce the severity of impact. This decreases both the possibility of injury to the wearer and failure of the equipment.

**Lanyards.** A  $\frac{1}{2}$ -inch manila rope has an ultimate strength of about 2,600 pounds.

Nylon rope has more stretch than manila which enables it to absorb shock and sudden loads. It has high tensile strength, wet or dry, is tough, flexible, durable, and easy to handle—is resistant to moisture and mildew and be stored wet.

Unolyn, another synthetic fiber, has shown remarkable ability for absorbing impact force. It elongates with constant resistance up to five times the original length. However, after being subjected to severe strain it will not return to its original length and should not be used again.

## Care of Belts

Dust should be brushed off carefully so as not to scratch the belt. A leather belt should then be washed with warm water and saddle soap or castile soap. It should be rinsed in clean warm water and allowed to dry in room temperature.

Leather belts should be treated with neatsfoot, castor, soybean or a compound oil, to prevent drying out, not a mineral oil. Leather should never be exposed to excessive heat.

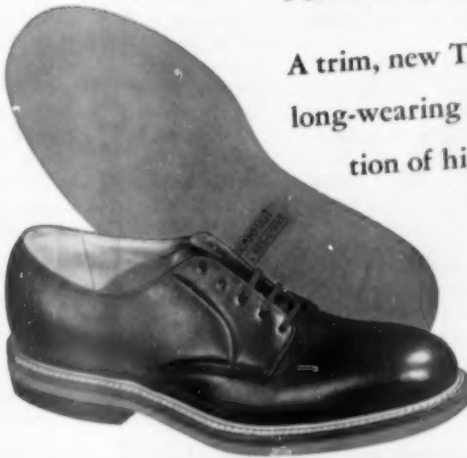
Webbing belts may be washed in soapy water, rinsed and dried by moderate heat. They are not dam-

—To page 151

# Bearfoot Announces

## 2 NEW SOLES for SAFETY SHOES

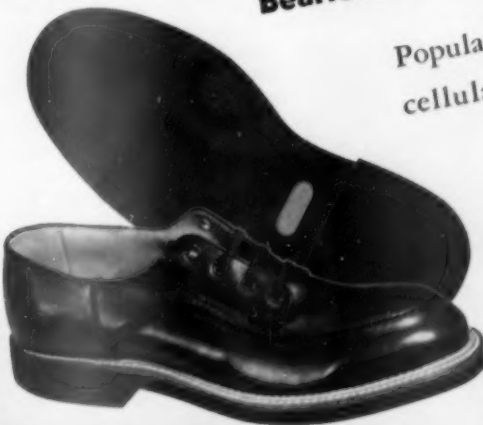
### For the executive



A trim, new TAN GRAINED Nuclear Safety dress Sole, long-wearing and oil-resistant. Made from a combination of highest quality resins and oil-resistant Buna.

Especially designed for use on today's safety dress shoes. 9-iron thickness, our style 829. Also available with cork for non-slip.

### Bearfoot Neoprene-Nitrocrepe



Popular oil-resistant, micro-cellular sole, introduced in 1952, has been used on over a million safety shoes.

Now available with "squeegee" saw-tooth tread for Non-Slip, giving greater traction under moist conditions.

Available in all specifications.



**THE BEARFOOT SOLE CO., INC.**  
Wadsworth, Ohio

183 Essex St.  
Boston, Mass.  
J. M. Calvin, Mgr.

1225 Water Street  
Milwaukee, Wisc.  
C. R. Gage, Mgr.

1602 Locust St.  
St. Louis, Mo.  
F. E. Alston, Mgr.

# HANDS AND ARMS

**FINGERS**, hands and arms are involved in approximately one-third of all reported industrial injuries. These parts of the body are exposed to many cuts, scratches, bruises, and burns in the course of the day's work.

Finger movement is necessary for practically all work and this makes protection difficult. For the forearm semi-rigid protectors are often practicable.

As is recommended for other types of protection, it is advisable to make a survey of jobs and hazards to determine:

- (1) Where protection should be worn;
- (2) What type of protection should be provided.

**Finger stalls, gloves, mittens, and hand pads** are made of a variety of materials to protect hands against cuts, abrasions and hot objects.

Some common materials and their uses are:

**Canvas**, the least expensive and least durable material, is satisfactory for light work. Duck and terry cloth are also used for handling objects which are not excessively hot.

A heavy twisted weave fabric is used for "hot mill" gloves. This material is also quite durable for handling rough objects.

**Leather** is more expensive and more durable for most jobs. It offers

greater protection against cuts and abrasions.

Chrome leather is used where there is exposure to sparks or molten metal. However, no material of animal vegetable origin will stand continued excessive heat.

**Metal staples** in gloves, mittens and hand leathers give increased protection when handling sharp or rough objects. Metal-studded gloves should not be worn around electric apparatus.

**Asbestos** is used where hands must be protected against extreme heat, as in steel mills, heat treating plants, welding, galvanizing, glass manufacturing, etc.

Asbestos gloves may be obtained unlined or with wool lining for added comfort and protection.

Heat-repelling mittens of aluminum-coated fabric between two layers of asbestos, jersey lined, offer unusual protection against heat. These mittens are reversible.

**Rubber, neoprene and vinyl films** are suitable for chemical laboratories and plants where acids and other corrosives are handled.

Neoprene and vinyl are particularly useful where petroleum products and some organic solvents are handled. Synthetic films vary in their resistance to chemicals and the manufacturer should be consulted about exposures.



Hand leathers can be heavier and less flexible than gloves and are often preferred for handling sharp and heavy objects.

Fabrics coated with rubber, neoprene or vinyl are used for light cleaning operations. They offer greater protection against abrasion than uncoated fabric.

When rubber or plastic gloves are worn for long periods, a lightweight cotton liner is desirable. If no liner is available, talcum powder should be shaken into the gloves before wearing.

Rubber, plastic and asbestos gloves should be long enough to come well above the wrists. Gauntlets should be equipped with locking devices to assure a snug fit about the wrists. Sleeves should be kept rolled down, leaving no skin exposed.

**Metal mesh gloves** are used in meat and other cutting. They should fit snugly.

**Linemen's gloves.** Rubber gloves worn by linemen and others engaged in electrical work are of a special type made to exacting specifications. They should be tested regularly and discarded when found worn, cracked or punctured.

For line work, overgloves of leather are worn to protect the rubber against damage.

Generally, gloves should not be worn when operating revolving machinery. An exception is buffing and

—To page 152



Work gloves of canvas, leather, asbestos, rubber and plastic-coated fabric.



Metal-studded arm guard and mesh glove protect meat cutter. Ring guard on knife is an added safeguard.





## MEET "HOT-HANDS" HARRIGAN



He didn't have neoprene gloves—had to learn the hard way. Unnecessarily, too, when gloves made with neoprene protect hands from oil, grease, acids, chemicals and abrasion. Workers appreciate the complete protection neoprene gloves give them . . . management welcomes the man-hours saved. What's more, gloves of neoprene stay comfortably flexible and resilient throughout a long service life—while they're outlasting all those pairs of ordinary work gloves.

When you specify rubber goods made with **NEOPRENE** . . . you get all these safety features:

- **RESISTANCE TO OIL, GREASE, AND MOST CHEMICALS**—neoprene protects against deteriorating agents
- **FLAME RETARDANCE**—neoprene won't support combustion
- **ABRASION RESISTANCE**—neoprene is strong and tough!
- **HEAT RESISTANCE**—neoprene won't soften
- **RESISTANCE TO SUNLIGHT, WEATHERING, AND OXIDATION**—neoprene won't crack or soften

While Du Pont does not make finished products of neoprene, your rubber-goods manufacturer or distributor will gladly tell you about the neoprene products he supplies.

### FREE! THE NEOPRENE NOTEBOOK

E. I. du Pont de Nemours & Co. (Inc.)  
Rubber Chemicals Division NE3  
Wilmington 98, Delaware

Please put my name on the free mailing list for the Neoprene Notebook—containing stories, illustrated case histories and new applications of neoprene.

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# NEOPRENE

The rubber made by Du Pont since 1932



REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



An employee of Humble Oil & Refining Company being outfitted with protective equipment at the new warehouse. (Photos courtesy "The Humble Bee")

## Sales and Service

Getting protective equipment worn is a selling job—even when the company pays the bill. And attractive facilities do help

**FROM NEW** modern quarters in the main refinery storehouse, safety equipment in great variety is being issued to employees at the Baytown, Texas, refinery of the Humble Oil and Refining Company.

Modern service and storage facilities were installed on the mezzanine floor of the storehouse to provide 2500 feet of floor space. The move from its previous location was part of an expansion of the safety program which included enlargement of the safety and training building.

New warehouse facilities include

modern roll-type steel bins arranged in three tiers. By rolling them to one side, access to the stored items is easy. The bins occupy a minimum of space.

One room in the new warehouse is especially equipped with roll bins for the large stock of safety shoes which employees may purchase at cost on convenient payroll deduction authorization plans. Shoes are kept in a variety of sizes and styles, with steel toe caps, and arch supports for comfort and protection. Men at the warehouse are trained

to fit shoes properly.

Another room contains bins and cabinets for storage of safety hats, goggles, masks, respirators, coveralls, and other types of personal equipment needed for the protection of refinery employees. Along two walls of this room are work benches with stainless steel tops where equipment is serviced.

Washing equipment is located near a small elevator which is used for handling washed safety equipment to and from an outside drying yard.



Protective gloves are dunked in a washing machine. Nearby are vats for cleaning and sterilizing equipment.



Large stocks of protective footwear are kept in these roll-type bins. Attendants are trained to fit shoes.



## Protection Against High Voltages

Special tools and protective equipment have been developed for linemen and generating station employees. Operating conditions vary but certain items are standard.

Tools used near energized equipment should be designed for the job and insulated to minimize the danger of short circuits in the equipment and shock to the operator. Insulation on tools alone, however, is not adequate protection near high voltages.

Items in common use include:

- Linemen's rubber gloves
- Leather protector gloves
- Rubber line hose and blankets
- Linemen's line hose and safety straps
- Climbers
- Rubber coats
- Tool pouches
- Tool buckets
- Fuse pullers
- Switch sticks
- Insulated stools
- Switchboard mats

Protective hats of insulating plastic or fiber glass are being worn by linemen.

Regular and thorough inspections should be provided for all protective equipment. Any article found defective should be replaced immediately.

Brooms, brushes and other cleaning equipment used around energized equipment should be free from metal. Insulating handles of tools should be kept clean and dry and only non-conducting preservatives used on them. Metal ladders should not be used in such locations.

In emergencies where areas are wet, wood platforms, insulated stools or rubber boots should be worn by maintenance workers.

See *Specifications for Rubber Protective Equipment for Electrical Workers*, ASA Series J6.

## Safety Belts

—From page 146

aged by any temperature up to the boiling point of water. The manufacturer of the belt should be consulted about the dressing.

Belts should be inspected before use by the employees who wear them. Every one to three months

they should be carefully inspected by a trained individual.

Leather belts must be watched carefully for cuts or scratches on the skin side of the hide. A deep cut on the skin side warrants condemning the belt.

Fabric belts should not be used if the outer plies are cut or worn through. All belt hardware should be checked and replaced if it shows signs of wear. If the belt is riveted, each rivet should be examined separately.

Life lines should be washed with mild soap and water and dried in circulating air. They should not be exposed to high temperatures. Rope should be kept in open coils and never bent sharply.

## Strictly for the Girls

Perfumed gloves, designed for women industrial workers, were among the products exhibited at the recent products show of the Purchasing Agents Association of Chicago. The gloves are made of impregnated canvas and the perfume is said to be mild—just enough to offset hand perspiration.

## LEG PROTECTION

**PROTECTION** for the legs is required in certain industries against the hazards of hot materials, corrosive substances, blows from sharp tools or heavy objects, and bites of poisonous snakes.

Protective garments vary from waist-length leggings to spats. For some occupations the extra protection of the longer types is desirable.

Materials commonly used are:

1. **Asbestos** for protection against molten metal, severe heat and heavy sparks.

2. **Chrome-tanned leather** for less severe exposure to splashes and sparks.

3. **Fire-resistant duck** to ward off light splashes and sparks.

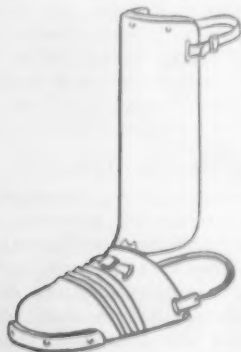
4. **Rubber, neoprene and plastic** for work with acids, alkalis and hot water.

5. **Lightweight alloys or fiber** for protection against blows from axes, adzes, and heavy objects.

**Leggings** for men who work with molten are designed to be removed instantly in an emergency. The leggings should have flares to protect the instep, and should be free from projecting buckles and clasps.

**Shin guards** of metal or fiber may be obtained separately or combined with footguards which cover the instep.

Chrome leather, when new, is less resistant to hot metal splashes and sparks. With use it acquires a tougher surface. The operator should therefore keep out of the line of fire as much as possible until the garment has been broken in.



Combination foot and shin guard.

**Knee pads** are worn on jobs which require continuous kneeling.



Leggings of asbestos or leather protect legs against sparks and molten metal.

Poisonous snakes are a hazard in some regions. Construction, petroleum, public utility and farm workers are among those most exposed. Bites received by a standing person are invariably below the knee. High boots are frequently worn, but more effective protection is provided by fiber leggings. Coverings of water-proofed duck protect the leggings against long wet grass.

### Hands and Arms

—From page 148

polishing on high-speed lathes where parts become too hot to handle with bare hands.

**Wrist and Arm.** Gauntlets offer some protection to the wrist, and arm protectors guard the forearm against light blows. The materials, depending on the protection required, include duck, wool, leather, rubber, plastics, and asbestos.

**Finger stalls** may be used where a complete glove is not necessary. These are available in combinations of one or more fingers. Materials used are rubber, leather, plastics, duck, asbestos, and metal mesh.

**Hand leathers, or hand pads,** are often more satisfactory than gloves for protection from heat, abrasion or splinters. They can be made heavier and less flexible than gloves. They should not be worn around moving machinery.

### Protective Creams

Creams are helpful in protecting the skin against many irritants when safety clothing is not practicable. These products are made in water-soluble and water-resistant types,



Stout gloves and leather aprons are needed on many handling jobs.

each in several grades for differing exposures.

Water-soluble creams are used for protection against cutting oils, paints, lacquers, varnishes, etc.

Water-resisting applications are used where the cutting oil, cooling lubricant, or other irritant has a water content of more than 10 per cent. These can be removed with soap and warm water.

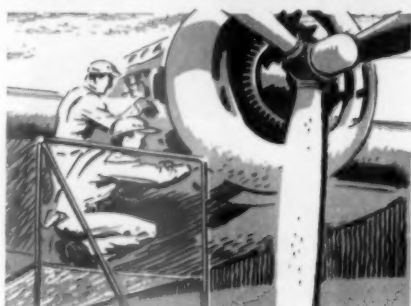
To be effective, coatings should be renewed frequently. They are not intended for protection against highly corrosive substances.

### Check These Items Before a Plant Shutdown

1. Remove all waste material from machines, benches, tables, and oily work clothing from lockers.
2. Clean flammable residues from ovens, spray booths, hoods and ducts.
3. Remove solvents, cements and all flammable liquids to safety vaults.
4. Disconnect unused gas and electrical equipment, close main valves and open main switches where possible.
5. Check fire extinguishers, fire pumps, hose, and fire-fighting equipment.
6. Check water pressure for sprinkler system.
7. Check piled stock for obstruction to overhead sprinklers.
8. Clean plant thoroughly of all debris; keep aisles clear and open.
9. Appoint standby crews or watch service for the shutdown period.
10. Notify Fire, Police, ADT and other services of vacation period.



Wherever fire hazards are present . . .



**DU PONT** **"X-12"**  
Renewable-Type  
**FLAME RETARDANT**

Work clothes treated with  
**"X-12"**  
**FLAME RETARDANT**  
give protection...comfort!

**ONLY FIRE CAN TELL THE DIFFERENCE** between treated and untreated clothing! Du Pont's new, renewable-type flame retardant penetrates the fabric completely . . . gives maximum protection against flame and afterglow. Since "X-12" does not seal pores of the clothing, *comfortable* protection is assured your workers.

Both industrial and commercial laundries can easily apply "X-12" in an economical, one-step operation. Re-applied with each washing, it gives clothing immediate protection against spread of flame . . . with no loss of tensile strength, hand, color, or texture.

**LET US TELL YOU MORE ABOUT "X-12."** Our colorful brochure describes its many industrial and commercial applications. See "X-12" in action . . . conduct your own flame tests on treated and untreated swatches. For your free copy, mail coupon below.



REG. U. S. PAT. OFF.  
BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY



E. I. du Pont de Nemours & Co. (Inc.)  
Grasselli Chemicals Dept., Room N-2539-S  
Wilmington 98, Delaware

In Canada: Du Pont of Canada Limited, Box 660, Montreal

Send me full information about Du Pont "X-12" Flame Retardant and its applications. I am interested in using it for \_\_\_\_\_

Name \_\_\_\_\_

Firm \_\_\_\_\_ Position \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

a new service to Industry

# GRO-CORD INDUSTRIAL DIVISION



**T**he Industrial Division of the Gro-Cord Rubber Co., headed by Mr. D. J. Wigglesworth, has been specially created to meet a long existing need for closer cooperation with shoe manufacturers in applying proper soling materials that assure maximum safety, comfort and longer wear. This new service helps Safety Engineers, Shoe Manufacturers and Shoe Retailers in three important ways—(1) by providing expert analysis of every workshoe soling problem . . . (2) by recommending a sole that has proven advantages for specific job conditions . . . (3) by enabling you to "sell the shoe with the sole for the job"—that assures greater worker satisfaction. Consultation on soling problems is available to all segments of the workshoe industry without obligation.



**"Sell 'em the shoe**

Write for literature  
Gro-Cord Rubber Company  
814 N. Jackson St., Lima, Ohio  
Gentlemen:  
Please send me the brochure "Service to Industry"  
and the Free Catalogue Sole Selection.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

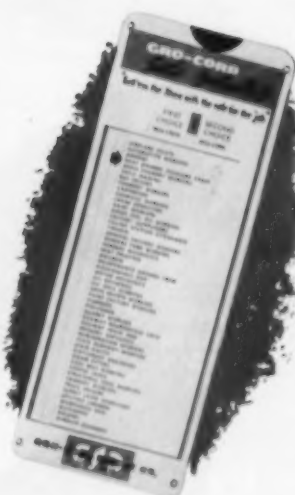
## what the Industrial Division can do for you...

The Gro-Cord Industrial Division will help you achieve greater success with your safety shoe and workshoe programs. The many valuable services offered by the Industrial Division are fully described in the brochure "Service to Industry." Write for it today!



## proper sole selection made easy...

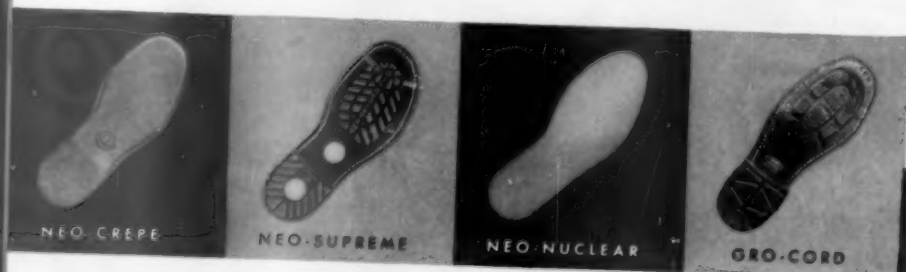
This free Gro-Cord Sole Selector instantly tells you which workshoe sole has the best comfort, wear and safety qualities for 50 basic job conditions. Just set the selector for the job condition . . . and there's the answer, with a first and second choice. Safety engineers, shoe manufacturers and shoe retailers will find the Gro-Cord Sole Selector invaluable. It's yours for the asking.



## why it's important to shoe retailers, shoe manufacturers, safety engineers

Workshoe soles that are practical for a carpenter won't do at all for the man who works around chemicals. Proper sole selection is essential if workmen are to get maximum safety, comfort and wear from their workshoes. The Gro-Cord Industrial Division enables you to recommend workshoes with soles specially designed for specific job conditions. With the help of the Industrial Division, you'll assure higher sales, greater worker satisfaction and that all-important repeat business.

Only Gro-Cord workshoe soles can solve every wear problem because only Gro-Cord offers a complete line of work and industrial soles . . . each thoroughly tested by actual on-the-job applications. There is a slip-resistant Gro-Cord sole for every industrial need—including industries where there is danger of sole damage from gasoline, acids, caustics, heat or scarring by metal chips.



COPYRIGHT 1955 BY GRO-CORD RUBBER CO.

# with the Sole for the job"

GRO-CORD RUBBER CO.  
LIMA, OHIO

*if you are responsible for the selection of  
safety shoes in your plant*

# CHOOSE



**1613**—Light tan wing tip, heavy oak outsole, half rubber heel, stormwelt.



**1660**—Barrett Scotch Grain blucher; double oak outsole, half rubber heel, stormwelt.

*These are the  
Lehigh styles  
most men  
buy*



**1633**—Light tan 3-eyelet blucher; granular Neocrepe bottom, double-deck welt.



**1621A**—Brown oxford, nylon mesh vamp, nylon mesh lined. Oak outsole, half rubber heel.



**711 FOR WOMEN**—Gray elk loafer; gored tongue, Paralite outsole and heel.



**1625A**—Tan elk woven blucher; heavy oiled oak outsole, nylon-mesh lined vamp.



**1611**—Brown moccasin; leather outsole, brass-nailed heel.



**1504X**—Brown moccasin, Neocard sole and heel, Dacron stitched throughout.



**1618**—Tan blucher moccasin, heavy oiled oak leather outsole, half rubber heel.



**1632**—Dark tan 3-eyelet blucher, natural Neocrepe sole, Dacron stitched thruout.



**1661**—Light tan 3-eyelet blucher; heavy oak outsole, soft cushioned innersole.

**ORDER DIRECT**—one pair or dozens, SHIPPED AS YOU NEED THEM!



# HERE *with confidence*



**1308**—6-inch russet elk blucher; Neoprene-cork outsole, oak middle, seamless back.



**1300**—6-inch black elk Congress boot; compo outsole, chrome middle, elastic side-gores.



**1310X**—Russet elk blu-bal. Neocord outsole, oak middle sole. Dacron stitched.



**1914**—10-inch mahogany retan engineer's boot; Neoprene comp. outsole and heel.



**L110X**—Black all rubber blucher shoe; tough carbon rubber bottom, sewed leather insole.



**1619AX**—5-inch russet 3-eyelet boot; oil-resistant comp sole, all Dacron stitched.

## FREE

Your employees can order direct from this complete catalog poster showing 72 Lehigh styles. Write for a copy.

**You SAVE on safety shoes... get one pair for every wear**



See us at **BOOTH NO. 16**  
Hotel Statler, New York  
APRIL 11th-15th

# LEHIGH

**SAFETY SHOE COMPANY**

EMMAUS, PA.

# Getting Them to Wear Protective Clothing

By ALFRED E. BERNEL

**SAFE CLOTHING** has been stressed by Firestone for many years and the use of protective clothing by factory employees is an extremely important part of our safety program. To highlight some of the equipment used and the methods to gain their acceptance, I offer this brief resume of our safety program.

The wearing of safety shoes in our plants is not mandatory but by impressing upon the employee through personal contact the advantages of his wearing safety shoes, we feel that we have eliminated several hundred toe injuries. To this you will agree from the following figures showing the percentage of sales in our Akron plants for the past several years.

	Per cent
1947	12.7
1948	17.4
1949	19.1
1950	24.1
1951	29.2
1952	35.4
1953	44.0

The effectiveness of our program is demonstrated by two of our plants having had 100 per cent safety shoe sales in the past year.

As an incentive to employees to purchase safety shoes, our Company pays \$2 toward the cost of each pair of shoes purchased. We consider safety shoes as personal protective equipment and, therefore, encourage the wearing of such equipment in the manner outlined above.

To stimulate the interest in the program the supervisors are divided into four groups for the staging of a contest. The duration of this contest is six months and at the conclusion the winning group is accorded some recognition in the form of a small gift awarded at a dinner attended by all participating supervisors. The winning group is decided by the awarding of points for each shoe sale or each sale of prescription glasses.

Alfred E. Bernel is Safety Director, Firestone Steel Products Company, Akron, Ohio. This article has been condensed from a talk at the Rubber Section, 42nd National Safety Congress.

Points are also awarded for correction of unsafe conditions and other items that are deemed to be safety features and made a part of the particular contest. In addition, there is a cash award to the supervisor selling the most pairs of safety shoes. As an additional incentive for the employees, one name is drawn from all the purchasers in a month, and that individual is refunded the price of the shoes he purchased.

The safety engineer maintains close personal contact with each supervisor to maintain enthusiasm for the entire safety program and especially to urge them to continue the employee contacts that are so necessary.

In hazardous operations we employ different methods and to cite an example, in one of our plants 16 per cent of the employees are furnished with safety toe boots as protection.

Sixty per cent of all Firestone employees are furnished with goggles, shields, or glasses. In several of our plants we demand 100 per cent eye protection on hazardous operations such as welding, grinding, chipping, machining, and the handling of chemicals and acids. Coupled with this, we have a prescription safety glasses program which is handled in the plant on a regular weekly schedule. Through this program every employee may purchase prescription safety glasses and have them individually fitted during his working day. He has a choice of several styles and types, and the company will pay \$5 of the cost of the glasses. In addition, if the lenses are damaged through an accident, such as the glass stopping particles from entering the eye, the company will replace the lenses free of charge.

In one of our plants 20.5 per cent of the employees purchased prescription safety glasses in the last 10-month period.

Four of our six Akron plants are registered with the Wise Owl Club, and in one of these plants eye protection has prevented five serious eye injuries within the last eight months, and the five concerned em-

ployees have become Wise Owl Club members.

I have mentioned some protective equipment that is used to safeguard our people from what might be classed as the more hazardous operations. Our company also provides safe clothing on operations where it is required to the extent that one of our plants is equipped 100 per cent with hard hats.

Asbestos gloves, gauntlets, jackets, rubber gloves and rubber aprons, are all designed to give the utmost protection. In our tank operations, air masks, safety belts and ropes are furnished to the employees. We also try by education to influence the type of common work clothing that the employee will wear.

We at Firestone by furnishing protective clothing and encouraging the wearing of it intend to keep safety on the same high level as the advancing design of machines.

## Be Sure the Shoe Fits

Poorly fitted shoes are a frequent source of discomfort and disability, both on and off the job. In industry it has been estimated that 65 per cent of the men and 75 per cent of the women suffer from foot ailments.

Comfortable and apparently correct shoes are responsible for a surprisingly large number of cases. Although a shoe may feel comfortable, it may not give adequate support, or it may even upset the normal balance of the foot.

Short shoes are common offenders. When too short from the heel to the ball of the foot they can cause more trouble than shoes which are too narrow.

Shoe lasts that do not allow for normal foot movement within the shoe cause much foot fatigue.

Much of the success of any safety shoe program will depend on the fit and comfort provided.

My dentist with his skillful touch

Injected novocain;

The inlay didn't hurt me much.

The outlay brought the pain.



## GRA-LITE OFFERS PROOF

## GREATER PROTECTION, LONGER LIFE ON EVERYDAY JOBS



Gra-lite garments . . . originally created in special designs for only the toughest of industrial chemical hazards are currently available in **all production patterns** . . . aprons, coveralls, coats, overalls . . . featuring unique armored seams, high abrasion resistance and extraordinary durability . . . the same qualities that earned it a "trouble-shooter" reputation on extremely hazardous jobs.

Remarkable Gra-lite durability means lower replacement costs. Armored seams give positive protection against seepage. Resistance to laundering chemicals adds still longer life.

### SEAM'S THE SECRET



Armoring is a fusing of additional Gra-lite over and through garment seams. It is **not** a coating process but is rather a permanent sealing of all threads and potential seepage points.

### WRITE FOR A TEST SAMPLE

We will be pleased to send you a Gra-lite swatch with specimen armored seam for test purposes. Just write giving the chemicals normally found on-the-job.

**STANDARD SAFETY EQUIPMENT COMPANY**  
232 WEST ONTARIO ST. CHICAGO 10, ILLINOIS  
NEWARK 4, N. J. CLEVELAND 10, OHIO LOS ANGELES 16, CAL.  
597 BROADWAY 855 EAST 152nd ST. 2952 CRENSHAW BLVD.



# PUT THE RIGHT "U.S."



## U. S. NEOPRENE SHORT BOOTS

Red Neoprene Rubber for heavy industry. Resists oils, grease, acids. Reinforced at all points of strain. Leak-tested. 100% waterproof. Shockproof Cushioned Insoles.



## U. S. TEMPERED RUBBER SHORT BOOTS—U. S. Royal

Tempered Rubber gives more wear than ordinary rubber. New Royal-Tuff finish is easily cleaned. "Shockproof" Insoles. Steel Toes or Plain Toes.

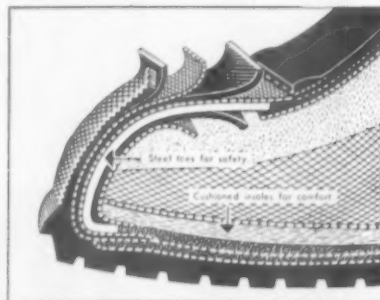


## BUTYLAC SNUGLEG BOOTS

Especially designed for dairies and meat packing plants. Resist butter fats, animal fats, lactic acid. 12-inch, snug-fitting ankle. Steel Toes or Plain Toes.



**TEMPERED RUBBER PATROL HI-CUT**—High-cut for full on-the-job protection. Longer-wearing U. S. Tempered Rubber, with Royal-Tuff finish. Anti-slip Tempered Rubber outsoles.



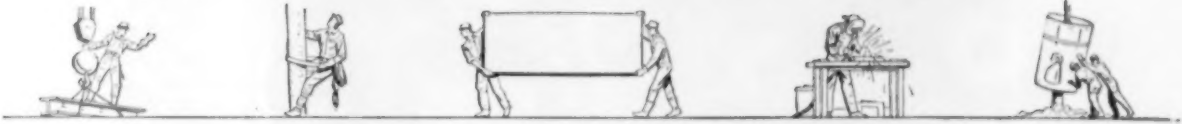
**STEEL TOES, 2000 POUNDS PRESSURE PROVEN.** Anti-injury protection keeps accidents to a minimum.



U N I T E D S T A T E S



# BOOT ON THE JOB!



## TEMPERED RUBBER BOOTS

Ten inches high, with Plain Toes or Steel Toes. Net-lined. "Shock-proof" Insoles. Get U. S. Tempered Rubber. Costs no more in the long run!



## TEMPERED RUBBER BLUCHER

**PAC**—Black "Royal-Tuff" Tempered Rubber, full 15 inches high. Net lining. Lightweight, long-wearing. "Shockproof" Insoles. Steel Toes or Plain Toes.



## BUTYLAC SHORT BOOTS

Invaluable to dairymen and meat packers. Resist lactic acid and animal fats. Cushion Insoles. Butylac deep-cleated, molded soles resist slipping.



R U B B E R C O M P A N Y  
ROCKEFELLER CENTER • NEW YORK



# B R E C K

## FOUR WAYS TO PROTECT SKIN FROM INDUSTRIAL DERMATITIS

BRECK pH7 PROTECTIVE CREAM protects the hands against irritants such as lubricating oils, cutting compounds, tar, greases, rubber dust, aromatic and hydrocarbon solvents, fiberglass, paint and iron dust. It forms a non-sticky, invisible film over the skin. Breck pH7 Protective Cream is easily applied. It is easily removed with Breck Hand Cleaner or soap and water.

BRECK WATER RESISTANT CREAM protects the skin against the action of water and water solutions such as liquid coolants, emulsified cutting oils, mist and spray from alkali baths and plating solutions, cement and lime. It covers the skin with a light, protective film which is not slippery or sticky. Breck Water Resistant Cream has a pH value of 8.

BRECK HAND CLEANER helps eliminate the use of harsh, gritty, highly alkaline or defatting hand cleaners. It does a thorough cleansing job, yet is mild and non-irritating to the skin.

BRECK WORK CREAM is used after exposure to degreasing materials and at the end of a day's work. It substitutes fatty materials for the natural skin oils which have been removed. In this way Breck Work Cream helps keep the hands smooth, pliable and lubricated.

A Breck Industrial Preparations Booklet



will be forwarded to you upon request.

JOHN H. BRECK, INC. • MANUFACTURING CHEMISTS • SPRINGFIELD 3, MASSACHUSETTS  
NEW YORK • CHICAGO • SAN FRANCISCO • OTTAWA • CANADA

## Wire from Washington

—From page 9

to direct the C. A. B. to procure an amendment to the Warsaw Convention on limitation of liability in overseas travel.

### Marine Safety

S. 460 (Magnuson) provides for life preservers for river steamers, and S. 743 (Magnuson) authorizes biennial inspection of hulls and boilers of cargo vessels, as recommended by the Treasury Department. H. R. 3111 (Flood) would require radio reports every 24 hours from all ships. H. R. 3204 (Boykin) would provide for a floating storm warning station in the Gulf of Mexico. H. R. 833 (O'Neill) would amend the Longshoremen's and Harbor Workers' Compensation Act to provide a system of safety rules and of safety inspection and training.

### Home Safety

S. 479 (Sparkman) and H. R. 2181 (Roberts) would require safety closing devices on household refrigerators. H. Res. 100 (Multer) would create a Select Congressional Committee on Consumer Interests.

The Secretary of Health, Education and Welfare, whose department includes the Food and Drug Administration, appointed a 14-member committee to conduct a study of the food and drug regulation program and to make recommendations on "the amount and kind of enforcement that is necessary to give the maximum amount of protection."

### Government Operations

The President, in his Budget Message, announced that to replace the current practice of including all workmen's compensation payments to Federal employees in a single appropriation, he would propose legislation to shift the financing of these benefits to the employing Federal agency, in order "to encourage better safety practices."

H. R. 3484 (St. George) would establish a program of in-service and out-service training programs for government and would permit for contracting with non-Government facilities for such training.

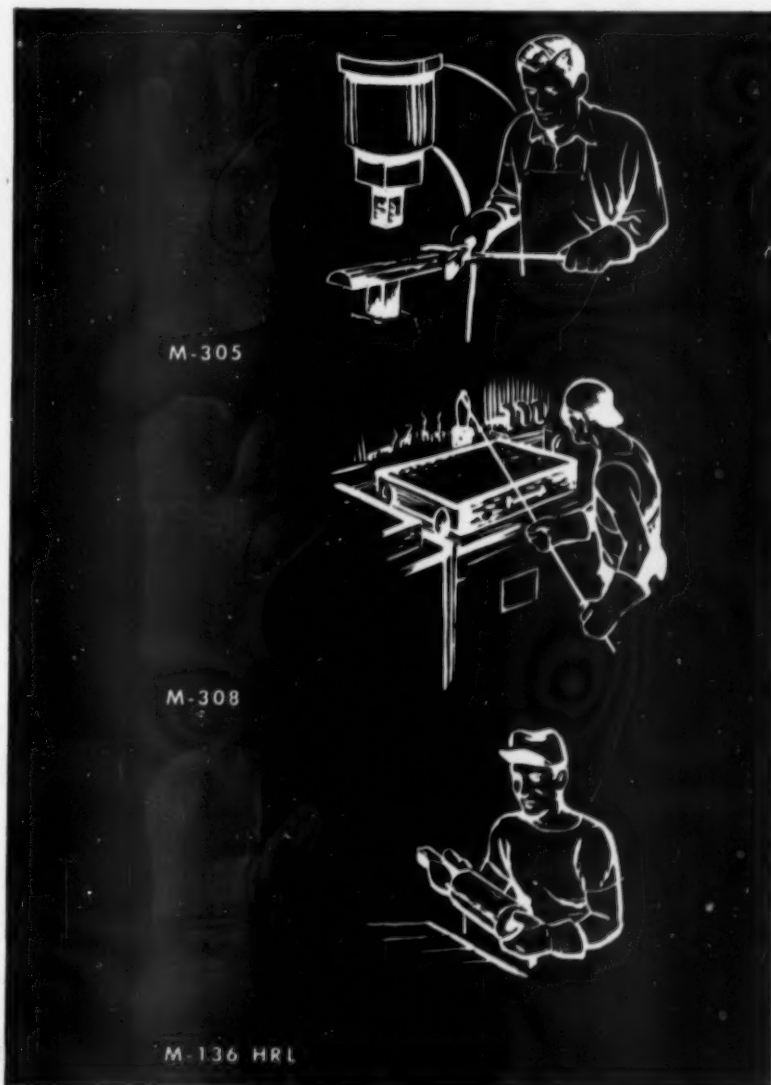
### Miscellaneous

A group of bills have been introduced dealing with the responsibilities of tax-exempt organizations. H. R. 2537 (Hays) and H. R. 2538, 2670, concern public accountability of such organizations, and H. R. 3776, 3777 concern information required from certain tax-exempt organizations.

# NEW RED JOMAC<sup>®</sup> FLAMEPROOF MITTS

These new red Jomac Mitts can easily be identified by supervisory personnel to insure the use of the correct mitt and thereby prevent injuries. Distinctive color also provides positive identification and speeds issuance from the stockroom.

WRITE FOR LITERATURE ON THIS NEW LINE OF RED JOMAC FLAMEPROOF MITTS—SAMPLES AND PRICES UPON REQUEST



JOMAC, INC. • PHILADELPHIA 38, PA.

# PROTECTIVE PLASTICS

## COMMON PLASTICS — THEIR PROPERTIES AND USES

**ACRYLICS**—Optical clarity, shatter resistance, weather resistance, machinability, wide color range.  
**Uses**—Goggles, face shields, aircraft turrets, auto tail lights, signs, brush backs. Dynel, Acrilan, Orlon textiles for work clothing.

**ALKYDS AND ROSIN MODIFICATIONS**—Good electrical insulation, heat resistance, dimensional stability, fast curing.  
**Uses**—Paints, ignition parts, magneto rotors, linoleum surfacings.

**AMINOS (Urea and Melamine)**—Good electrical insulation, resistance to organic solvents, unlimited color range.  
**Uses**—Buttons, dishes, laminated table tops, housings for kitchen appliances.

**CELLULOSE PLASTIC MATERIALS**—Toughness, high impact strength, good electrical insulation, ease of fabrication, lustrous finish.  
**Uses**—Frames for eyeglasses, irrigation pipe, display packaging, Rayon and acetate textiles.

**COUMARONE—INDENE AND PETROLEUM RESINS**—Resistance to water and caustic cleaners, compatibility with compounding ingredients, glass.  
**Uses**—Asphalt floor tiles, waterproof coatings, aluminum paints, printing inks.

**EPOXIES**—Excellent adhesion, resistance to chemicals and heat, can be cured at room temperatures.  
**Uses**—Adhesives, surface coatings, transformer and motor laminates, printed circuit backing.

**FLUOROCARBONS**—Extreme resistance to solvents and corrosive agents, high impact strength, wide temperature range.  
**Uses**—Chemical tubing, high temperature insulation, pump diaphragms.

**NYLON**—Good strength and toughness over wide temperature range, wear resistance, self-lubricating.  
**Uses**—Gears, rope, brush bristles, slide fasteners, combs, nylon textile.

**PHENOLIC and other tar acid resins**—Hard and rigid, good electrical insulation, low water absorption, good temperature range.  
**Uses**—Protective hats, goggle frames, grinding wheels, plywood, telephone handsets, radio-TV cabinets, shell molding, dials.

**POLYETHYLENE**—Inert to solvents, flexible and tough over wide temperature range, non-toxic, odorless, tasteless.  
**Uses**—Coaxial cables, semi-rigid kitchenware, squeezable bottles, packaging.

**POLYESTER RESINS**—Weather resistant, strong, formable with low pressure, compatible with many fillers.  
**Uses**—Reinforced plastics for auto bodies, boats, translucent panels, Dacron textiles.

**SILICONES**—Extreme heat resistance, good dielectric properties over wide frequency range, low water absorption.  
**Uses**—Insulation for generator coils, circuit breakers, waterproof coatings, auto polishes.

**STYRENE RESINS**—Lightest of commercial plastics, excellent moldability, tasteless, odorless, unlimited color range.  
**Uses**—Lighting fixtures, wall tiles, refrigerator parts, kitchen ware, toys and novelties.

**VINYL RESINS**—Tough and strong, excellent electrical insulation, resistance to chemicals, oil and weathering.  
**Uses**—Floor tile, protective garments for a wide range of exposures, metal and fabric coatings, rainwear, pipe and pipe fittings, valves, electrical insulation, machine and structural parts.

**Note:** Data presented in this table were obtained largely from The B. F. Goodrich Company and Bakelite Corp. The number of applications of these plastic materials involving safety and industrial hygiene could, of course, be expanded considerably.

**MODERN LIVING** and many industrial processes have been revolutionized by the introduction of an enormous variety of moldable synthetic materials described by the general term "plastics." Many of these have important uses in protecting the worker against accidental injury and occupational diseases.

Plastics have a wide range of characteristics. They may be transparent, translucent or opaque. They can provide tough, pliable films or hard, shatter-resisting masses. For years they have been used for protection against the hazards of falling and flying objects, corrosive chemicals, dusts, gases, vapors, and other injurious agents.

One reason for the wide use of plastics is their resistance to deteriorating agents. From hundreds of compounds, it is possible to obtain a suitable one for a particular purpose.

Most natural materials offer only limited resistance. Rubber, for example, while an excellent impermeable material for many uses, is affected by oil, sunlight, heat and some acids. When worn next to the skin for long periods it may cause irritation.

Some untreated fabrics, like cotton and linen, are flammable and readily affected by acids.

A plastic to meet any specific hazard can usually be compounded. Compounds can be made impervious to oils, acids and most organic solvents. Some are shatter resistant, non-conductive of electricity, and heat and cold proof. It is often possible to combine many of these properties in one compound.

Some plastics are non-toxic, odorless and tasteless and are suitable containers for food products. They can be molded to very close tolerances, an important factor in economical production. Most of them can be produced in a wide range of colors which gives them considerable eye appeal.

Articles of safety equipment in which plastics are used include:

- Goggles and face shields
- Hard hats
- Respirators, gas and dust masks
- Garments of plastic film or coated fabric
- Containers for first aid kits
- Instruments for the dispensary

The subject of plastics and their uses is an extremely complicated one—too involved for extended discussion here. A list of the more common types of plastic materials with their properties and uses will be found in the accompanying table.



# KIM

# no-glo



## TREATED COTTON FABRIC

for welding, scarfing  
and other light-hazard  
occupations

**KIM no-glo** — the *durable*,  
light weight, comfortable, treated cotton  
fabric safety clothing has no "after-glow"  
when charred. The impregnation  
compound is non-soluble and everlasting.

**KIM no-glo** fills the definite  
need for cooler, more comfortable safety  
clothing. Where *serious* industrial hazards  
are present we still recommend  
KIMBALL ALL-WOOL Safety Clothing.

### OTHER KIMBALL SAFETY PRODUCTS...

**EYE PROTECTION:** Spectacle Goggles, Welding Goggles, Composition Goggles, Sideshields.

**HAND PROTECTION:** GLOVES: Welder's, Asbestos, Steel Stitched. MITTENS: Welder's, Asbestos,  
Steel Stitched.

**BODY PROTECTION:** CLOTHING: Wool, Flameproofed Cotton. LEGGINS and SPATS: Leather, As-  
bestos, Flameproofed Cotton. APRONS: Leather, Asbestos, Flameproofed Cotton.



## Kimball SAFETY PRODUCTS COMPANY

9310 Wade Park Avenue • Cleveland 6, Ohio

# STOP *slipping!*

## BILTRITE SAF-T-CEL SOLES



### SQUEE-GEE DESIGN

- ▶ DuPont Neoprene oil proof
- ▶ Lightweight cellular crepe
- ▶ Squee Gee design for extra non-slip traction

*Available in a variety of colors  
and thicknesses with matching heels  
and Neoprene oil proof midsoles*

### SMOOTH OR CRINKLED

- ▶ DuPont Neoprene oil proof
- ▶ Lightweight cellular crepe
- ▶ Resilient, flexible, and long wearing
- ▶ Available for stitched or cement shoes

FROM THE WORLD'S  
LARGEST PRODUCER OF  
SHOE SOLING MATERIALS



**AMERICAN BILTRITE**  
RUBBER COMPANY

CHELSEA 30, MASS. • SHERBROOKE, QUEBEC, CANADA

# GO

# *safely!*

## BILTRITE SURESTEP SOLES

NEOPRENE

OIL-PROOF  
BILTRITE

### NEOPRENE COMPOSITION SOLES

- ▶ Resist oil, grease, chemicals and acids
- ▶ Firm, long wearing compound
- ▶ Rugged design with green non-slip plugs
- ▶ Available in black or brown with matching heels

### NEOPRENE CORK SOLES

- ▶ Resist oil, grease, chemicals and acids
- ▶ Resilient, flexible and long wearing
- ▶ Styled for modern industrial use
- ▶ Available in black or brown with matching heels

### FLOATING CORK SOLES

- ▶ So light they float on water
- ▶ Insulate against heat, cold and shock
- ▶ Resist abrasion from gravel, metal filings and other occupational hazards
- ▶ Available in silver, brown, black or red with matching heels



## BILTRITE

HEELS AND SOLES



FROM THE WORLD'S LARGEST PRODUCER  
OF SHOE SOLING MATERIALS

**AMERICAN BILTRITE**  
RUBBER COMPANY  
CHelsea 30, MASS. • SHERBROOKE, QUEBEC, CANADA

# THE SAFETY WARDROBE



HATS, CAPS  
HELMETS

Sports	Hot Materials	Heat	Hot Liquids	Moisture	Acids & Alkalis	Slips & Falls	Falling Objects	Flying Particles	Electric Shock	Cuts & Abrasions	Burns/Scalds	Explosives	Machinery
1	2	3	4	5	6	7	8	9	10	11	12	13	14
X	X	X											
X		X		X	X				X		X		
X							X	X		X		X	
X							X	X	X	X			

Asbestos  
Plastic-Rubber  
Cotton-Wool  
Metal  
Plastic

COATS, APRONS  
WAIST PROTECTION

1	2	3	4	5	6	7	8	9	10	11	12	13	14
X	X	X											
X	X		X					X		X			
			X	X	X			X		X	X	X	
			X	X	X			X		X	X	X	
					X			X	X				X
				X									

Asbestos  
Chrome Leather  
Plastic  
Rubber  
Canvas-Fiber  
Chemical Resistant  
Reflective Fabric

SLEEVES  
WRISTLETS

1	2	3	4	5	6	7	8	9	10	11	12	13	14
X	X	X											
X	X	X						X		X			
X	X	X						X					X
			X	X	X						X		
			X	X	X			X		X			
				X									

Asbestos  
Chrome Leather  
Flameproofed Duck  
Plastic  
Rubber  
Chemical Resistant  
Reflective Fabric

GLOVES, MITTENS  
HAND PADS  
FINGER GUARDS

1	2	3	4	5	6	7	8	9	10	11	12	13	14
X	X	X											
X	X		X					X		X			
			X	X	X			X		X			
			X	X	X					X			
											X		
										X			

Asbestos  
Chrome Leather  
Rubber  
Plastic-Rubber Coated Fabric  
Metal Mesh  
Cotton-Canvas

PANTS, KNEE PADS  
LEGGINGS

1	2	3	4	5	6	7	8	9	10	11	12	13	14
X	X	X											
X	X	X						X		X			
X	X	X						X		X			X
			X	X	X						X		
			X	X	X			X		X			
				X									

Asbestos  
Chrome Leather  
Flameproofed Duck  
Fiber-Metal  
Plastic  
Rubber  
Chemical Resistant  
Reflective Fabric

SHOES, BOOTS

1	2	3	4	5	6	7	8	9	10	11	12	13	14
							X		X				X
			X	X	X	X							
			X	X	X	X			X				
			X	X	X				X		X		
				X	X	X							
												X	

Steel Toe Caps  
Non-Skid Shoes  
Wooden Soles  
Chrome Leather  
Rubber  
Conductive Rubber



## The Clothes You Wear Or Don't Wear

From Safety Newsletter,  
Petroleum Section, NSC

**Item No. 1** is a safety hat. You may not believe it, but a large number of serious accidents happen because something fell on somebody's head. Sometimes it is a nail, or sometimes it is a piece of pipe or wood. Whatever it is, if your head is not protected, you are going to get hurt.

On hot summer days you are going to sweat like a brewery horse, and that hat is going to feel like a bake-oven on your head. But don't take it off. It can and will save your life. If the derrick should shed a nut and you are standing below, a hard hat would be a very nice thing to have between you and the falling nut. You might, and probably would get a headache out of it, but you would get over a headache in a hurry. It takes months to repair a busted skull, and sometimes it never gets done. **So wear your hat.**

**Item No. 2** is a good pair of safety shoes. If you could look over the list of men in your own company

who have been laid up because of dropping something on their own feet, you would never go to work without wearing a pair.

Just to take a case in point from the records. A roustabout was handling pipe. He rolled a length of it along the table with his foot. It rolled back towards him and landed on his big toe. Result: a smashed toe and ten days off the job.

Then there was the man who was using a wrench as a hammer. It slipped out of his hand and hit another of the gang on the foot. Result: two broken toes.

Be sure that the soles are in good repair. Worn out soles make it too easy for nails or jagged hunks of metal to stab into your feet.

**Item No. 3** is a good pair of gloves. Naturally, gloves are not perfect protection. If you hit yourself on the finger with a hammer, gloves will not make the blow painless. The main reason for wearing gloves is to prevent the small type of accident which all too often becomes serious. Wood or metal splinters often cause infections, and sometimes infections cause amputations.

**Item No. 4** is a pair of safety glasses. There are plenty of times

when a job is of the type that necessitates wearing safety glasses as protection for your eyes. The accident report file is full of cases in which a small object lodged in the eye. Usually they received immediate first aid and were taken care of with no after effects. But every now and then you run across a case in which the man involved only rubbed his eye and almost went blind because of it.

In the majority of these cases a pair of safety glasses would probably have prevented the entire thing. There is the all too common case of the gent who was using a screw-driver with a hammer. A piece of metal flew up and hit him in the eye. Glasses would have saved this person a bad time.

So, whenever there is any chance of flying particles of any sort, put on a pair of safety glasses. A glass eye might amuse your kids, but it won't be much help in the oil business.

**Item No. 5** is on clothing in general. Maybe you think the local chamber of commerce exaggerates when they boast of the nice sun-shiny climate. Well, whether you agree with them or not, the sun does beat down pretty strongly at times,

## ...Flexible, Neoprene Coated HOOD HEAVY-DUTY GLOVES



**Model 4705**  
Also available as 7705,  
12" gauntlet.

**HOOD RUBBER CO.,** WATERTOWN,  
MASSACHUSETTS  
A division of the B. F. Goodrich Company

**CHECK THESE HOOD FEATURES:**

- Designed for handling heavy objects with sharp edges
- On-the-job tested for durability
- Curved, natural-fit fingers
- Roomy fingertips
- Extra-heavy neoprene coating without loss of flexibility

Hood Rubber Company makes a complete line of rubber and plastic gloves for industrial uses. Write today for our illustrated catalog featuring the Hood Glove Guide — shows you "How to choose the RIGHT glove for EACH job".



## ...How to Obtain Better Welding Protection Per Dollar

### curtains

Initial protection is only half the story in purchasing welding curtains. Unless oils and grease can be washed out frequently without destroying fire resistant properties, your welding curtains can quickly become fire hazards.

StaSafe glass cloth welding curtains last longer and cut replacement costs by combining the basic fire resistance of glass cloth with the flame retardant features of the StaSafe Neoprene compound. Harsh laundering can not destroy these qualities. You get better protection in longer lasting curtains when you insist on StaSafe.



### tarpaulins

Asbestos, though one of the best floor and machine tarp materials has certain disadvantages. It snags, ravel and has a tendency to absorb oils and greases, thereby shortening its useful life.

StaSafe has carried asbestos a step further by impregnating it with an oil and grease resistant, flame retardant neoprene compound. This combination gives snag-free, ravel-free service with an absolute minimum of oil and grease saturation. It all spells longer life, superior safety and lower costs.

For Full Information on StaSafe Curtains and Tarps Write in Today for Free Bulletin S-10.

## STANDARD SAFETY EQUIPMENT COMPANY

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LOS ANGELES 16, CAL.  
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and during those times, a sunburn is an easy thing to get.

So, if you are one of those people who turn pink instead of brown when the sun comes out, **keep covered** until you are used to it. There are a few cases of men who wore torn shirts and who got badly burned through the torn section. So wear clothes that fit right and are in good condition.

Incidentally, never wear clothing that is soaked in oil, gasoline, or any other substances that might catch fire with you in them. If you should ever get splashed with any such stuff, change clothes at once. These same liquids on your clothes can cause very bad skin irritation even if you don't go up in smoke.

### Safety Clothing

—From page 142

Leather reinforced by metal stitching or wire staples is resistant to cuts and abrasion.

**Impervious materials** of many types provide protection against dust, vapors, mists, moisture and corrosive liquids. They are useful in handling materials which would cause dermatitis or burns. This type of material includes rubber, neoprene and vinyl films and fabric coated with them.

**Rubber** resists acids, caustics and other corrosive substances, as well as moisture. Garments of rubberized fabric are used when handling low concentrations of acids and non-caustic liquids and for protection against weather. Rubber's high dielectric strength makes it useful where electricity is used.

**Neoprene** has numerous applications in safety equipment. It forms a tough durable film resistant to oils, solvents, acids and alkalis. It has high dielectric strength.

**Vinyl plastic** has many uses in safety equipment. For some garments the plastic is rolled or calendered onto fabric. For others the strong pliable film is used without backing.

**Flame-resistant duck**, a lightweight fabric, is quite strong and will outwear ordinary material used in work clothes. For protection against extreme heat, asbestos should be used.

**Water-resistant duck** is recommended in exposures to water and non-corrosive liquids. It combines strength and durability with light weight.

—To page 171

# Safe-Hi ROPE GRAB...

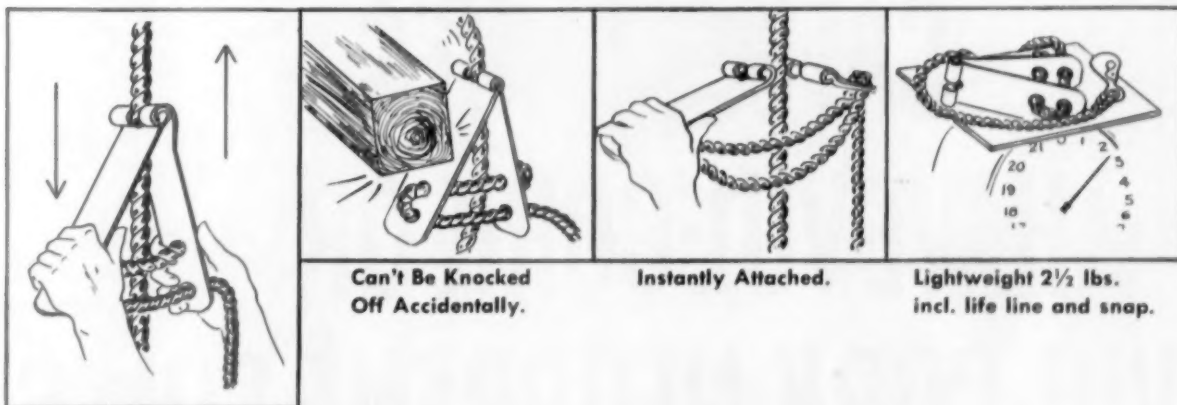
The safe, practical shock absorbing attachment for life lines!



New safety... convenient, practical and on the job 100% of the time... is now available for men who work in high places. The SAFE-HI ROPE GRAB enables the workman to quickly and safely secure his life line to a vertical  $\frac{3}{4}$ " manilla rope hung through the working area. The rope grab can be easily secured, can be moved up or down, cannot be accidentally knocked off the rope, absorbs the shock of a fall, is light and convenient, and will last indefinitely.

The SAFE-HI ROPE GRAB is especially practical and safe for men who work on scaffolding, swinging stages, structural steel, bridge building and in every other type of work where men are exposed to the hazards of falls.

"FOR THE MEN WHO WORK IN HIGH PLACES"



Easily Moved Up or Down or Removed.

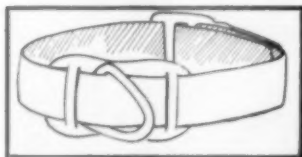
Can't Be Knocked Off Accidentally.

Instantly Attached.

Lightweight  $2\frac{1}{2}$  lbs. incl. life line and snap.

SAFE-HI ROPE GRAB  
Catalog No. 550.

SEE YOUR SAFETY DEALER

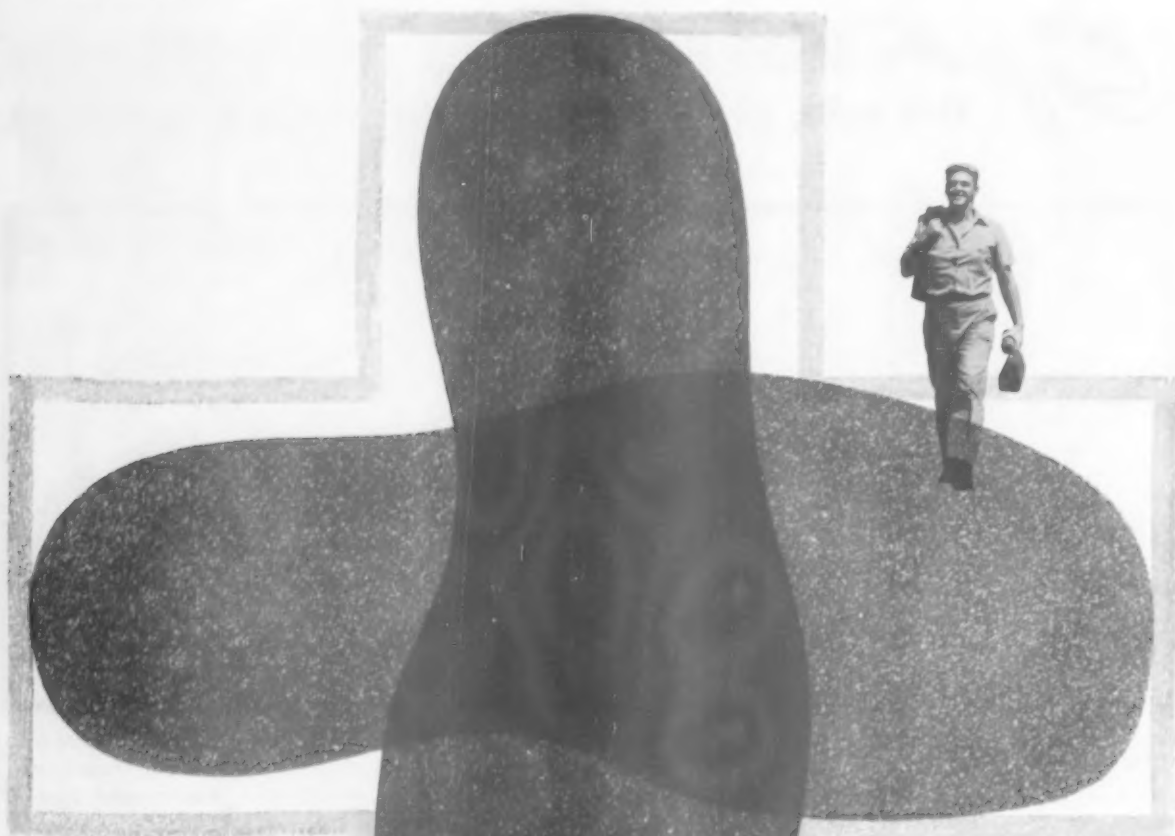


Construction workers belt, light, inexpensive, strong. The perfect companion for the SAFE-HI ROPE GRAB. High safety factor. Fully adjustable. No. 150.

ROSE MANUFACTURING CO.

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**Safe-Hi**  
DENVER



# **SAFER SAFETY SHOES HAVE VUL-CORK OR VUL-CORK NEOPRENE SOLES**

Vul-Cork Sole Division, Cambridge Rubber Co., Taneytown, Md., makers of **Vul-Cork**®  
... so light, so flexible, so resilient ... you can roll them up right in the palm of your hand.





## IF YOUR EXPOSURE IS HIGHLY IRRITATING SOLVENTS



It's a proven fact. Actual tests show Ply No. 9 Gel effective against chemicals causing dread Dermatitis.

This non-irritating gel, developed and thoroughly tested over a period of years under actual working hazards, is completely transparent, spreads easily and becomes invisible on the skin.

Ply No. 9 Gel contains the ingredient "Milbex" to prevent spotting or corroding of highly finished metals due to acid deposits from perspiration or any moisture caused by handling.

With Ply No. 9 Gel the worker no longer need fear the most commonly used acids, resins and solvents. Whatever the hazard, Milburn has developed a specific Ply Cream to combat it.

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VALUABLE BOOK!**

*"The Answer  
to Industrial  
Dermatitis"*



**SPECIFY PLYGLOV FOR  
10 TIMES THE WEAR**



Plyglovs can reduce your work glove costs as much as 75%—will outwear up to 10 ordinary pairs. Plastic coated to protect hands from industrial liquids.

**THE MILBURN CO.**

DETROIT 7, MICH.

*The Standard of Perfection in Protection*

## Safety Clothing

—From page 168

Synthetic fabrics, such as dynel, orlon and vinyon, are used for durable work clothing. These fabrics resist acids, caustics, mildew, abrasion and tearing. They stand up well under repeated laundering.

Aluminized duck and drill are used for garments where radiated heat is a problem.

**Flameproofing.** Fabrics cannot be made non-combustible but some treatments provide limited fire resistance. There are two principal types of treatments, (1) Water soluble, (2) Weather resistant.

Commercial and home-made water soluble treatments are effective but must be renewed with each laundering. Weather-resistant treatments for canvas, duck, and other fabrics used for awnings, tent, tarpaulins, truck covers and welding curtains require special processing which can best be done by finishing mills or chemical companies equipped to do this work.

### Welder's Clothing

Protective clothing is as much a part of the arc welder's equipment as the helmet and goggles. Cotton shirts and dungarees worn in warm weather can be ignited quite easily. Garments of chrome-tanned leather may prevent serious burns.

Leather garments include overalls, pants, chaps, aprons, jackets, sleeves, gloves, mittens and spats.

Garments should be of good quality leather, solidly constructed. Fastenings must prevent gaping and should be so designed that the wearer can get out of the garment quickly. There should be no turned-up cuffs or other projections to catch hot metal. Pockets should be equipped with flaps.

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Women's Industrial Clothing—L18-1944 Series.

Protective Occupational Footwear, Men's and Women's—Z41-1944 Series.



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Who Has a  
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Problem!

We have discovered the solution to your work glove problem. All we ask you to do is send us your name so we can recommend reputable manufacturers of work gloves who are now using our "Special Tanned" leather. Gloves made from this leather outwear all other cowhide work gloves because our "Special Tanned" leather has greater resistance to heat and will retain their original softness after washing or dry cleaning.

A special process was used to produce this leather which resulted in a distinctive green color without the use of dyes or color pigment. The green color and our special insert in each pair of work gloves is your guarantee that Gebhardt's "Special Tanned" leather was used in the glove.

We invite you to job test work gloves made from "Special Tanned" leather.



**FILL OUT AND  
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I'm interested in finding where I can obtain gloves made from "Special Tanned" leather.

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ABRASIVE HAZARDS—

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**\*DESIGNED TO FIT THE MAN  
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## Burns and Their Emergency Treatment

BURNS may be caused by:

1. Radiant heat, including sun-light.
2. Super heated steam.
3. Flame.
4. Hot liquids (above 160 degrees).
5. Hot metals.
6. Chemicals, such as phenol, acids, alkalis, and cutaneous gases.
7. Explosives.
8. Electric spark or current.

Burns are generally described as first, second, and third degree, depending on the depth of destruction of tissue. A first degree burn may be described as one affecting only the outer surface of the skin, causing a redness or erythema of the skin,

Second degree burns as those which more or less destroy the skin,

Third degree burns as those which not only destroy the skin but the underlying tissues as well.

A first degree burn is serious only when affecting a very large skin surface.

A second degree burn affecting half the body surface is usually

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Skidmasters are non-skid sandals worn over the shoes to provide sure footing on slick surfaces, and insulate the feet against the discomfort of working on hot, cold or wet floors. Skidmasters stand up under rough usage. Steel mills, laundries, breweries, dairies, cold storage houses—hundreds of industrial users find them practical insurance against hazardous floor conditions.



Promote Safety in Your Plant—Write Today for Bulletin No. 50

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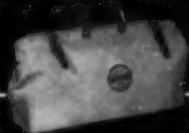
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SAFETY HARNESS



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TOOL BUCKETS

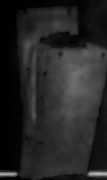


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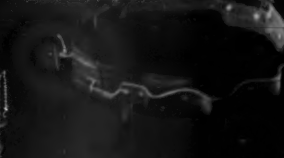


TOOL  
POCKETS



ROPE SLINGS  
LANYARDS

SAFETY STRAPS



SAFETY BELTS



NYLON  
SAFETY BELTS  
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WITH BUILT-IN AND BUILT-UP QUALITY, LONG LIFE AND JOB PROVEN PROTECTIVE PERFORMANCE

CHARCO Flex-Saf Gloves and Flex-Fit Sleeves are made of the same top quality rubber. Both well exceed ASTM specifications, and also the most critical inspection and testing standards of the industry.

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BUY ONLY THE VERY FINEST  
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fatal; if affecting one-third of the body it is often fatal and is serious also in causing scar deformities and contractures.

Third degree burns are always serious as to end results; but a wide second degree burn is more menacing than a deep but restricted third degree burn.

The body surface can be plotted roughly as follows: one half to the trunk, one eighth to each lower extremity, one twelfth to each upper extremity, and one quarter to the head, face and neck.

Shock occurs an hour or so later and is known as surgical shock. Surgical shock is of frequent occurrence in second degree burns and depends in severity on the area involved and its extent, and has been found to be due to the out-pouring of fluid or plasma into the vesicles and the outer surface of the body and may be enormous, amounting to 70 per cent of the total blood volume within 90 minutes.

It is highly dangerous to assume in case of burns that one has a comfortable period of some minutes or hours, during which one may feel complacent about the absence of surgical shock. Depletion of plasma begins at once in severe burns and treatment must be commenced at once.

In severe burns toxic infection is liable to occur about the fourth day, which may seriously involve the liver, kidneys and elsewhere. This liability may be considerably diminished by forethought in first aid treatment.

**Treatment.** Treatment for burns is being revised constantly. New therapies have been introduced from time to time and many of them discarded later. One of the serious problems is to keep well meaning people from making the injury worse while waiting for medical care.

The following suggestions are offered by *Fireman's Fund Record*:

1. The purpose of first aid is to seal off the burned area promptly. It should not be touched, breathed on, or left exposed to air—for in these ways germ infections may be introduced.

2. Gauge the seriousness of the burn. A first degree burn reddens the skin. A second degree burn raises blisters. A third degree burn chars the flesh. Bad burns are open wounds and liable to infection.

3. Better be safe than sorry. Rush the patient to the hospital if there is any question at all about the seriousness of the burn.

—To page 177

**FOR  
COMPLETE  
PROTECTION  
AGAINST ...**



Styles illustrated  
50-00 Jacket  
51-05 Pants  
53-15 Hat

**Protective Clothing  
by Sawyer**

**Wears like Iron** — takes endless rubbing, scraping, snagging, and still gives full protection.

**100% Waterproof** — made with top quality base fabric saturation-coated first and then coated with 6 coats of Neoprene Latex.

**Positively** will not blister, crack or peel. Its longer lasting quality means greater economy.

**Also:** Three-quarter and long coats, aprons, coveralls and many other styles. All clothing made in black or yellow.



Cambridge, Massachusetts



# Bashlin's Linemen's Choice

Lightweight  
Champions—  
climbers with  
removable  
self. Stock.

Chippewa Boot—6 to 11 and 12  
with 16" top. With or without  
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## SAFETY EQUIPMENT



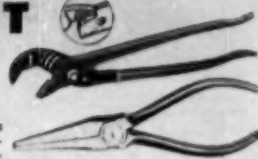
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Full Range of  
Size. Stock.



Tool Belt with or with-  
out holster  
with tape  
sling, ham-  
mer loop,  
snap. Stock.



Tool Buckets  
— Canvas, fi-  
bre top, leath-  
er bottom 12"  
— 16" Depth.  
Stock.



Chan-Nel-lock gripping tongue  
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Vacuum Grip Pliers perfect  
balance easy cutting. Stock.



Safety Straps—24 Styles Finest  
Leather, Bashlin Craftsman-  
ship. Stock.



Clear Grip—Ease E Grip  
Plier Handles. 9"—8"—  
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**LOW COST . . .  
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## COMPLETE PROTECTION

IN YOUR PLANT:

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The Safety Welding Shield that is light-weight, easily portable, can be shaped around any welding area for complete protection, hangs flat, with built-in corner steel rings for overhead welding protection. Excellent protection on power grinding and chiseling operations. Fully Underwriters Laboratories Approved material. A low cost investment to protect your personnel and property anywhere in your plant. Provides full outdoor protection, too and is an excellent windbreak. Standard sizes from 18" x 36" to 72" x 108". Special Sizes on request.

### FROM HIGH RADIANT HEAT WITH RAY-FOIL

The amazing Protective Heat Cloth that permits personnel to work comfortably only inches away from high industrial heat temperatures. Ray-Foil comes as curtains—drapes—shields and on Masonite panels, for portability for all plant maintenance work. Protekote Patented garments to completely protect personnel during short term exposure to radiant heat. NOW! . . . Ray-Foil Mastic Tape for fabricating and repair operations.

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IN  
**SAFETY  
SHOES**  
FOR  
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**G-25.** Brown, Two Eyelet Moccasin. Leather Soles—Rubber Heels. Full Cushion Insole, Dryseal Storm Welting.



**G-26.** Brown, Genuine Scotch Grain. Leather Soles—Rubber Heels. Dryseal Prestitched Double Deck Storm Welting.



**G-40.** Burgundy Blucher. Neoprene Cork Soles and Heels. Full Cushion Insole, Dryseal Storm Welting.



**S-401.** Brown Moccasin. Neo-Cord Soles and Heels. Popular All-purpose Oxford



**S-403.** Brown Overlay Moccasin. Neo-Crepe Soles and Heels. Slip and Oil Resistant. Tough, Pliable, Waterproof.



**S-436.** Burgundy Lace-to-Toe Blucher. 17 Iron Neo-Cord Soles and Heels. Genuine Rawhide Laces. Waterproof Storm Welting.

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Write today for our new giant-size

**BROCHURE**

Showing the entire display  
of RICO and GUARD-AIRE Safety Shoes  
in color!

## Burns

—From page 174

4. Do not use hearsay remedies such as cold tea, butter, tannic acid. They may do more harm than good.

5. The key to proper first aid is a well-stocked medicine chest. Useful items for treating burns are gauze pads, petroleum jelly, and two kinds of sterile, fine-meshed bandages—one of petrolatum, the other dry.

6. The best way to treat burns is to avoid them. Stoves and grates, lighting fires with kerosene, cleaning clothes with flammable liquids, smoking in bed, fireworks and bonfires, hot fats and metals, chemicals and electricity are the eight most common causes of burns.

## The Shoe Business Has Complications

The desirability of having employees wear safety shoes is never questioned by safety men—and seldom by management. Getting the employees to buy safety shoes, however, still requires salesmanship.

The larger plants approach this problem by operating in-plant shoe stores at which safety shoes can be purchased at the wholesale price and on payroll deduction. This method is effective because safety shoes are of very good quality and are sold at an attractive price. Unless the man just wears out old shoes on the job he cannot beat safety shoes for cost.

The small plant is confronted with a serious problem in trying to operate its own in-plant shoe store. To provide a variety of sizes, widths, and styles, a large stock is necessary. One pair of each normal size and width will require at least 32 pairs of shoes in stock but then if one sale is made, the store will be out of business for that size until the wholesaler sends a replacement pair. Thus there is a doubling up on the popular sizes, adding some 14 pairs in the center sizes.

The store now stocks 46 pairs of shoes but still only one style. To offer a choice of two or three styles, which is reasonable and certainly highly desirable would require a permanent stock of 100 to 150 pairs of shoes representing an investment of \$1000 or more.

Even then, the small plant has to store these shoes, fit them, and handle complaints or adjustments. To do so requires space and equipment as well as the time of the person placed in charge.

One plant recognized that little headway would be made in an effec-

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**ALL-NEOPRENE GLOVES**



These two new all-neoprene top quality gloves offer a real bonus in job efficiency and economy, through extra long life and superior hand protection. One is solid black for general use; the other truly white for food processing and sanitary purposes. Both have red inner lining and red roll at the cuff; and both have plus qualities in hand comfort, flexibility and touch sensitivity.

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ON THE USE AND PERFORMANCE OF CHARCO PRODUCTS DEPENDS OUR REPUTATION—AND THE SAFETY OF THOSE WHO USE THEM.

**NO WONDER WE MAKE ONLY THE FINEST**

**PROVE THIS IN YOUR PLANT! PLACE A TRIAL ORDER TODAY**

"NEO-SOL" BLACK

"NEO-SOL" TRULY WHITE

**CHARLESTON RUBBER COMPANY**  
16 STARK INDUSTRIAL PARK  
CHARLESTON, SOUTH CAROLINA



## ALJAY "Saf-7" CAPES, BIBS and COATS of LEATHER

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Capes  
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Saf-T Garments assure the best in Welders' Protection.

All garments made of finest specially-treated, chrome-tanned leather for heat resistance.

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- Full-Size
- Riveted
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is the most  
important  
part of  
our name

**GARDWELL**  
*Products*

## ELIMINATE COSTLY ACCIDENTS LINED ASBESTOS GLOVES

With leather reinforced palm, fingers and thumb. 1-pc. reinforcement affords complete front coverage including back of index finger and thumb. Available in 11" and 14" lengths. Underwriters grade and comfortable design.



## READY FOR INSTANT USE GARDWELL FIRE BLANKET AND CONTAINER

Adjustable to wall. Quick bottom release. Water-tight seal keeps blankets clean and dry. Painted bright red and comes complete with woolen 66" by 84" blanket. Can also be used for asbestos blankets 66" x 80".

22" gauge steel container.  
20" x 9" diameter.



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### GARDWELL FRANK LEGGINGS FOR BETTER LEG PROTECTION

Easily and quickly adjusted to any size leg. Ideal for protection against splash, blow-outs and impact. Available in heat-resistant chrome leather, Asbestos cloth, fireproof duck or synthetic-impregnated materials.

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**Safety CLOTHING AND EQUIPMENT Co.**  
DESIGNERS AND MANUFACTURERS  
1990 EAST 69TH STREET • CLEVELAND 3, OHIO  
PHONE HENDERSON 2-0400

tive safety shoe program if a variety of styles and sizes was not easily available to employees, but did not want a large stock in the plant.

The next thought was to arrange with an established retail store to honor requisitions given employees for purchases on payroll deduction. This method has its difficulties. No store was conveniently located; some employees lived in small communities to the north and some to the south. Also there was the cost factor. The merchant needs a mark-up to cover his expenses and profit whereas the in-plant store sells shoes at wholesale.

A third method appealed to this plant as being the answer. A mobile shoe service is operated in this industrial area. It consists of a truck equipped as a shoe store and manned by an experienced fitter who is responsible for all adjustments. A variety of styles and a full range of sizes are carried in the unit. Periodic visits are arranged, according to plant requirements. Between visits shoes can be obtained on special order in one day.

This service is rendered on a modest mark-up basis and the plant can charge the employee any part of the cost. This plant absorbs the mark-up, making the shoes available to the men at the same price as would be paid at an in-plant store. Payment is also made by payroll deduction.

Such service is available in many communities or from a near-by large community. Information can be secured from shoe company main offices.



Where clothes become damp, as in mining, clothes raised on hooks and in baskets dry quickly in circulating air near the ceiling. (Mine Safety Appliances Co.)



# FOR WHATEVER YOU DO...

*there's a Dorsey*

## SAFE-T-SHOE



NO. 3900

A handsome shoe of finest quality for style, comfort and safety.



The PARATROOPER  
No. 4432

Genuine oil tanned for comfort, looks and long wear.

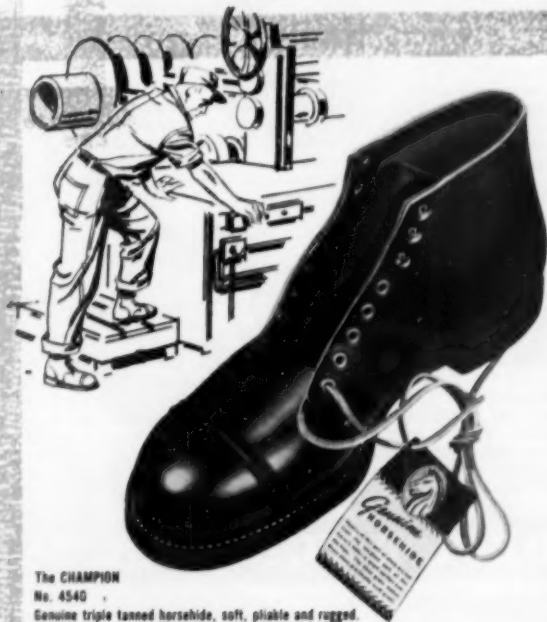


## Dorsey SAFE-T-SHOE

## Dorsey SAFE-T-SHOE

The Dorsey Safe-T-Shoe SAFELY  
"KEEPS YOU **ON** YOUR FEET"

A variety of styles are available, from expertly finished calfskin oxfords, to heavy duty horsehide work shoes—designed with full leather vamp and steel arch support to keep you comfortable for long hours of standing. . . . The properly selected sole for your type of floor hazard can be obtained from our stock. DACRON stitching, the new wonder thread that is resistant to acids and alkalis and with magical wearing qualities, make Dorsey the best buy in safety shoes.



The CHAMPION  
No. 4540

Genuine triple tanned horsehide, soft, pliable and rugged.



For rough industrial uses where a dress shoe does not belong, Dorsey goes all-out for comfort and long-wearing durability which comes with the use of the finest leather and workmanship.

## Dorsey SAFE-T-SHOE

THE MOST COMPLETE LINE OF  
INDUSTRIAL FOOTWEAR! WRITE  
TODAY FOR ILLUSTRATED FOLDER.



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# W. H. SALISBURY & CO.

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MANUFACTURERS OF RUBBER PROTECTIVE EQUIPMENT  
FOR LINEMEN AND OTHER HIGH VOLTAGE WORKERS

## INTERLOCKING LINE HOSE



Completely surrounds the wire with a thick wall of rubber having high dielectric strength. Locks itself in place but is easy to apply or remove.

Sizes: 3/4", 1", 1 1/4", 1 1/2" inside diameter.

Lengths: 3', 4 1/2', 6'.

## RUBBER INSULATOR HOODS



Used in conjunction with Line Hose to cover conductors as they pass over insulators. Inward extending flanges prevent accidental dislodgement. Compact construction. Convenient to handle.

## CONNECTOR-END LINE HOSE



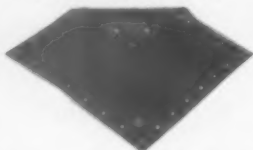
Standard Line Hose with built-on connector-end for joining to additional lengths or for covering enlarged wire taps, leads on stud type transformers, etc. Sizes same as standard line hose.

## LINEMEN'S RUBBER BLANKETS



Indispensable for covering odd shaped equipment. Made of best grade rubber with long-life and high dielectric qualities. Sizes 36"x36" and 36"x27". Also available with "Snap-Button" and eyelets.

## SNAP-BUTTON RUBBER JACKETS



Highest quality small size rubber blanket, 22"x22", equipped with Salisbury hard rubber button fasteners and used to cover dead ends or other similar hazards that require securely fastened protection.

## LINEMEN'S TOOL BAGS



Non-metallic canvas bags properly shaped and constructed for safety in raising heavy tools and supplies to men on poles or other elevated places. Sizes 8"x14" or 12"x16" for tools and 7"x48" for line hose.

## LINEMEN'S RUBBER SLEEVES



Protect the arms and shoulders from accidental contact with "hot" equipment. Held in place by adjustable rubber strap across the shoulders. Made in chromium plated molds to insure high voltage resistance, smooth surface and long life. Regular and extra large sizes.

## NON-SPILLABLE P. B. COMPOUND POTS

Provide a safe and convenient means to carry insulating paint and brush. Being made of semi-hard synthetic rubber, they are non-conducting, non-breakable and are unaffected by the usual P. B. compound used.



## LINEMEN'S GLOVE BAGS



Necessary for glove protection in storage and transportation and useful, when properly labeled, for personal identification. Made of heavy waterproof duck, sturdy and durable. Snap hook and "D" ring attached. Size 8" wide, 15" long.

## LINEMEN'S RUBBER GLOVES

Best grade steam-cured gloves, carefully made to meet all standard specifications. Furnished in curved or straight finger style. Standard gloves are rated at 10,000 volts, 14"-16" long.



15,000 or 20,000 volt gloves are available. All sizes and half sizes from 9 to 12.

## RUBBERCUFF PROTECTOR GLOVES

Similar to our standard all-leather protector glove with the addition of a full-length molded rubber cuff. Rubber cuffs do not increase current creepage to the forearm. They prevent costly snags in gauntlets of linenmen's rubber gloves which are required to extend beyond ordinary leather protectors. Furnished in several sizes to fit perfectly over rubber gloves.



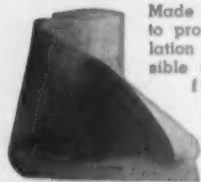
## ALL-LEATHER PROTECTOR GLOVES



Worn over rubber gloves to protect them from injury. Made of specially tanned Grade "A" buffed horsehide and carefully designed to fit perfectly over rubber gloves. Soft and pliable under all conditions. Do not become slippery when wet. Band-top or gauntlet styles. All sizes.

# A DEVICE FOR EVERY ELECTRICAL HAZARD

## SWITCHBOARD MATTING



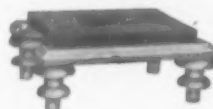
Made especially to provide insulation from possible ground in front of switchboards or other electrical equipment. Rated at 40,000 volts and meets the A. S. T. M. specifications. Widths 24", 30", 36", 48". Any length.

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Static Resisting Rain Coats  
Electric All-Rubber Rain Coats  
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Designed to provide a safe, low platform for men with hazardous tasks in substations, underground vaults and power plants. Size 18" x 12" x 6" high. Guaranteed.

★ SEND FOR CATALOG L-4 ★

### Combustibility of Fabrics

**Acetate.** Ignites readily, melts and burns quickly but somewhat less than rayon or cotton.

**Acrilan.** Ignites readily, melts and burns like cotton.

**Cotton.** Burns rather rapidly.

**Dacron.** Ignites with difficulty, melts and burns slowly.

**Dynel.** Difficult to ignite, melts but does not support combustion.

**Fortisan.** Burns rapidly but is more resistant to heat than cotton or linen.

**Nylon.** Quite difficult to ignite, melts but does not support combustion.

**Orlon.** Ignites readily, melts and burns like cotton.

**Polyethylene.** Melts and burns very slowly.

**Rayon.** Ignites readily and burns rather rapidly.

**Saran.** Ignites with moderate difficulty, self-extinguishing, melts but does not burn.

**Vicara.** Burns rather easily but less flammable than rayon and cotton.

**Vinyon & Vinyon N.** Difficult to ignite, melts but does not support combustion.

**Wool.** Burns slowly tending to be self-extinguishing.

**X-51.** Melts at open flame.

### Dentistry in the Health Program

Neglected and septic mouths are a potential source of costly loss to employees and industry alike. No one can estimate the suffering and ill health that accompany wholesale dental caries due to lack of knowledge and lack of dental care.

One of the first steps in a preventive medical program should be the care of the mouth. Some form of dental program should be incorporated in the industrial medical program in order to bring the results of preventive practice to a higher degree of perfection. Industrial dental programs may be educational, emergency, remedial or all three.

A dental program consisting simply of clinical examination with X-ray service will disclose findings along the following lines:

1. Dental caries
2. Root abscesses
3. Pulp stones
4. Infectious mouth diseases (trench mouth, etc.)
5. Non-infectious mouth diseases (pyorrhea, etc.)

## GOODYEAR WELT COMFORT MOLDER AND BLUCHER LACE WORK SHOES

Made with FLEXIBLE, SWEAT-PROOF INNERSOLES and HEAT RESISTING GORE



**Style No. 802**

Russet retan upper  
Heavy cork composition sole  
Austempered steel box toe  
Goodyear welt construction

**Style No. 902**

Same as above except  
chrome leather sole



**Style No. 200**

Russet retan upper  
Heavy cork composition sole  
Plain, soft toe  
Goodyear welt construction

**Style No. 702**

Same as above except  
chrome leather sole



IN STOCK  
IMMEDIATE SHIPMENT

**Style No. 7372**

Black elk upper  
Corded OILPROOF sole  
Austempered steel box toe  
Goodyear welt construction



**Style No. 8872**

Black elk upper  
Corded OILPROOF sole  
Austempered steel box toe  
Goodyear welt construction



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New, Patented\* Rescue Suit Protects Wearer  
In 2500° radiant heat... permitting complete freedom of action  
and providing extra safety.

## FYRE-ARMOR



- Reflects more than 95% of all radiant heat.
- Body temperatures remain NORMAL under FYRE-ARMOR.
- Light-weight FYRE-ARMOR protection offers complete mobility.
- Developed after years of research.
- Amazing record of successful use by municipal and military fire fighting departments and airport crash stations.

New available here for the first time, after years of exhaustive research. Light-weight, absolutely flexible, FYRE-ARMOR Rescue Suits weigh no more than an ordinary suit or coat.

Unusually fine fire-resistant fabrics are fused by a patented process to metallic layers and then topped by specially treated durable aluminum foil which provides a higher heat reflectivity than any other process of aluminization. Special copper coated heat resistant safety goggles and visors offer full 180° visibility to round out the versatility of amazing FYRE-ARMOR.

Other models include a Fire Proximity suit for use by Fire fighters who work in the immediate vicinity of flame only and are subjected to high heat radiation; the FYRE-ARMOR FM Hood and special equipment for firemen who do not require a complete protective garment. Industrial suits and a full line of industrial apparel including face shields, vests, aprons, gloves and legging-spats for workers who are exposed to high heat and flame. FYRE-ARMOR special equipment includes drop curtains, tarpaulins and blankets to shield inflammable materials and for rescue work.

At no cost FYRE-ARMOR safety engineers will survey your requirements. Write, wire or phone today for full information.



\* Patented in Europe  
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LEADING MANUFACTURER OF SAFETY GARMENTS

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PRODUCTS INCLUDE

GLOVES	SLEEVES	FOUNDRY	JUMPER
SPATS	HATS	LEGGINGS	SUITS
HELMETS	PANTS	FOUNDRY	OVERSHOES
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ARM	MASKS	FINGER	KNEE PADS
PROTECTORS	APRONS	PROTECTORS	HAND PADS

MADE IN ASBESTOS — LEATHER — FIREPROOFED DUCK

**HOLCOMB SAFETY GARMENT CO.**  
118 North Jefferson Street Chicago 6, Illinois

6. Miscellaneous — tumors, fractures, root erosion, tooth abrasions, soft tissue lesions, root tips, etc.

These conditions may often continue without symptoms, and their detection at an early stage may save considerable time, pain and money at a later date.

Many people hesitate to go to a dentist because of both the expense and the prospect of painful treatment. Modern dentistry with local anesthesia has almost eliminated the latter objection but dental restorative work is often expensive.

Dental examinations at the plant will often induce employees to take care of their teeth but it is desirable to have fillings, extractions and dentures taken care of by the employee's own dentist.

## Poison Ivy

Both poison ivy and poison oak produce an oil which, even in small quantities, causes severe irritation of the skin. The amount necessary to cause an infection is so small that the poison may be carried by the smoke from burning plants or may be transmitted by clothing or insects.

Individual susceptibility varies rather widely. Some are not affected, even by direct contact with the vines, while others contract the infection merely by coming in contact with the smoke from the burning plant.

Symptoms usually appear within a week or ten days following exposure. Small blisters appear which gradually unite to form larger blisters. These are filled with pus, and scratching usually opens them, allowing the pus to run over unaffected areas of the skin, thus spreading the disease. If not given medical attention, the rash may spread over a large portion of the body, causing a high fever and great discomfort. The services of a physician should be obtained in such cases.

The best method of preventing infection is to avoid contact with the plants. If a crew is fortunate in having men who are immune from the infection, these should be sent ahead of the rest to clear the path of the poison plants. However, the fact that a person is immune from the poison at one time does not mean that he will always be immune.

As soon after exposure as possible, the exposed areas should be washed thoroughly with plenty of hot water and soap, preferably laundry soap. Make a thick lather several times, but do not use a brush,



as that would only increase the danger of poisoning. If possible, the affected areas should then be washed with rubbing alcohol and rinsed with clear water.

If a rash develops in spite of precautionary measures, the areas should be washed with hot water and soap, then with rubbing alcohol, and in addition a 5 per cent solution of ferric chloride should be applied. The solution should be applied once or twice a day until the rash has disappeared. The same solution may be used as a preventive on parts known to have been exposed.

## The Purchasing Team

Purchasing agents are normally cost conscious—they have to be. So, when the safety director recommends the expenditure of several thousand dollars in the interests of safety, he should be ready to defend his request with evidence that the hazard is real and the investment is justified.

One of the major diplomatic objectives of the safety director is the establishment of a good working agreement with the engineering and

purchasing departments. To achieve such a relationship, the safety man must display an appreciation of operating problems and convince operating men that his ideas are practical.

To meet competition, manufacturers of machine tools and processing equipment list safety devices designed for the protection of the operator as auxiliary equipment. The machines may be purchased with or without safety devices. The safety director should be familiar with the machine and its operation and be able to satisfy the purchasing agent that a well-guarded machine is worth the extra cost.

When it comes to purchasing, a thorough knowledge of the accident history of the plant and the preventive value of his recommendations will be extremely helpful.

Familiarity with codes and standards is important. It carries considerable influence when a requisitioned item is approved by an authoritative body. The safety director should be familiar with:

1. Codes and standards approved by the American Standards Association.
2. Codes and standards adopted

by federal, state, or local governmental agencies having jurisdiction.

3. Standards published by the National Bureau of Standards.

4. Approval lists published by testing agencies such as Underwriters' Laboratories, Factory Mutual Laboratories, and the United States Bureau of Mines.

5. Safe practice recommendations of such agencies as the National Safety Council and the insurance carriers or their associations.

Knowledge of these standards will enable the safety man to advise the purchasing department when required.

Further contributions which the safety director can make to safer operation include:

1. Check plans and specifications for machinery and equipment before purchasing.

2. Prepare lists of "acceptable" personal protective equipment, tools, standard guards, and other items.

3. Keep the purchasing department informed concerning sources of accidents in the plant.

4. Keep in touch with the engineering department in regard to machines and processes which need changes in design or planning.



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with \$50.00 purchase of  
any of the following:—

**VEREX** Protective Cream, 2.7 oz. and 4.1 oz. tube

**CLEREX** ( Solvent Protection ) 3.0 oz. and 4.5 oz. tube

**H-R CREAM**

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ADVANTAGES

• Saves Ointment
• No Caps Lost

• Prevents Mess
• Saves Time

HYGIENE RESEARCH Inc.

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Samples of  
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# The **HEAT'S OFF** with **LIBERTY ALL-LEATHER HEAT RESISTANT GLOVES**

These gloves are not ordinary work gloves, but are made from a patented process on soft, flexible leather, impregnated with insulating and refractory materials.

They have outworn ordinary work gloves six to eight times on many operations. Temperatures from 500 degrees F to 800 degrees F can be safely handled, depending upon the type of glove required.

Not only do they afford protection to the hands, but many hot materials can be handled without tongs or other equipment, thus saving both time and money.

If your dealer cannot supply you, we would be pleased to receive your inquiries.

**LIBERTY PROTECTIVE LEATHERS, Inc.**  
14-16, FOREST ST., GLOVERSVILLE, N. Y.

5. Give the engineering, medical and purchasing departments information about fire and health hazards.

6. See that purchases conform with generally accepted standards, state regulations and local ordinances.

Anyone concerned with purchasing should be constantly on the lookout for new products, equipment or suppliers that will aid safety and efficiency or cut costs.

This flow of information should not be one way. The purchasing department also can help the other departments by giving technical advice on new materials or substitutes and on trends in prices, availability, or quality.

## Low Salt Diets May Be Injurious

A warning against the current fad of so-called "salt-free," "salt-poor" or "low sodium" diets is sounded by the Illinois Medical Society in its release of July 19, 1954.

It is dangerous to disturb the salt balance of the body, the society points out. The only persons who might be benefited are those seri-

## TWO OLD STANDBYS . . . ACCEPTED AND APPROVED BY INDUSTRY



**PRACTI-KREME . . .** the effective skin protector and cleaner for over 15 years. Checks dermatitis before it starts. Apply before work to provide flexible, fat-based coating over skin. Moistened after work, Practi-Kreme cleans completely.



**PHLO® . . .** neutral skin protector now fortified with silicones . . . rich in lanolin. Effectively bars bacteria, irritants and soil. Magic silicones make Phlo water-repellent, adhesive, non-toxic. Try it . . . you'll be convinced that new Phlo should be in daily use in your plant.



## NEW PHLO WATERLESS . . . THE "BEST BET" IN THE WATERLESS HAND CLEANER FIELD

New Waterless Phlo removes industrial soils fast. Contains *both* silicone and lanolin for double protection. Safe, easy to use, Waterless Phlo is milky white, smooth in consistency. Management and workers appreciate the time-saving convenience of having a jar at their fingertips always.

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**THE CHEMICAL CORPORATION**  
54 Waltham Avenue, Springfield 9, Mass.

ously ill of heart or kidney diseases, who should therefore be under the constant care of a physician.

The danger is especially serious in hot weather. The increased loss of salt through excessive sweating in summer heat can cause a severe reaction. This might even be fatal in a person whose salt or sodium reserve is already depleted by an unsupervised low-salt diet.

Sodium and chlorine are essential to normal body function. Every body cell requires sodium in some way. A proper balance among sodium, potassium, and calcium is essential to normal heart action.

Chlorine is also required for health; an adequate supply permits the body to manufacture hydrochloric acid, a component of gastric juice which is necessary to digestion.

Americans get much of their daily requirements from their meals, part of it is taken in the form of extra table salt.

Moreover, in areas such as the Great Lakes basin, the soil is deficient in iodine, which is essential to the functioning of the thyroid gland. Iodine is usually added to table salt sold here to prevent the type of goiter due to lack of iodine.

When table salt is removed from the diet of the resident of Illinois, therefore, he may be dangerously deprived of three elements essential to life—sodium, chlorine and iodine.

Occasionally a physician will take the risk to relieve the symptoms of certain patients suffering from heart or kidney disease. This is a calculated risk. The patient must be watched constantly to see that his sodium reserve does not drop below the minimum essential to health, even to life.

The physician must be ready to increase the sodium intake immediately in case of sudden additional loss of sodium, such as that due to prolonged heat and excessive sweating.

Perspiration contains sodium chloride and its loss via the sweat glands can be severe. That may occur even in normal persons exposed to extreme heat, with weakness, nausea, cramps, collapse, coma, and even death, unless the sodium deficiency is quickly corrected.

The society points out also that a salt-free diet as a means of losing weight is largely futile since little or no fatty tissue is lost.

*You've never seen a purple cow?  
Then I can safely bet  
You haven't yet invested  
In a color TV set.*

## Knee-Shin-Foot Protection by "Sankey"



"SANKEY" Shin Guard and  
Shin-Knee Guard



Shin-Instep Guard and  
Knee-Shin-Instep Guard

The "Sankey" fibre guards are formed to the contour of the leg. Pads fastened to the top and bottom of the inside of the guards provide comfort and act as a shock-absorbing device. Absolute freedom of leg and foot action is assured.

Combination Foot and Shin Guard (right) made of light weight aluminum alloy offers the maximum in foot and shin protection.



Combination  
Foot-Shin Guard

For additional information about "SANKEY" Foot, Toe and Leg Protective Guards please write the ELLWOOD SAFETY APPLIANCE CO., 219 Sixth St., Ellwood City, Pa.

119

863

0127

653

722

120

1270C

613

**18% SAFER!**

**BONE-DRY**

**STEEL TOE**

**SAFETY SHOES**

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**SHOE MFG. CO.**

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## Care of Safety Shoes

Keeping shoes clean adds to their life as well as to their appearance. After wearing, muddy shoes should be cleaned with mild soap suds and wiped dry if possible.

Shoes of elk, retan or similar leather can be preserved and made more water repellent by treating with animal or vegetable oils or shoe compounds once a week or oftener. Shoes of smooth grain upper leather should be cleaned with saddle soap and polished with a high-grade shoe polish.

When shoes become wet from perspiration or from outside moisture, they should be dried away from any heat. When drying, shoes should be placed on ventilated shoe trees to keep their shape. If shoe trees are not available, the shoes could be stuffed with crumpled newspaper. After extreme wetting, dried shoes should be treated with castor oil or neat's foot oil.

Leather can be made water repellent by use of silicone dressing.

Leather soles may be soaked in boiled linseed oil at intervals to off-set the effect of flexing.



## Welder's Glove

FOR LIGHT AND MEDIUM  
WELDING JOBS



FLAME  
RESISTANT

HEAT  
RESISTANT

**SERVES THE SAME PURPOSE AS  
LEATHER WELDING GLOVES  
AT 1/2 THE PRICE**

Hundreds of very closely knitted loops per square inch prolong wear ... offer flame and heat protection ... increase manual dexterity! Perspiration will not harden or stiffen it!

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## Planning the Plant

—From page 93

He must have room to move material being processed. At machine tools he must have space for hoists, lifts, or hand or power driven trucks.

Movement of both persons and materials should fit smoothly into the general scheme of traffic.

In continuous line operation, where machines are frequently served by conveyors, little or no intermediate storage space for materials is necessary. In other types of operation added space for storage of raw and finished materials is essential.

**Work and storage space.** Space for the full needs of equipment and operators and for the movement and storage of materials should be provided.

Insufficient headroom is often a hazard. "Temporary" installations of pipe lines, equipment supports, overhead conveyors and other installations that might cause head bumps can often be avoided. Elevation drawings should be studied to determine the exact location of equipment that might cause trouble.

Vertical clearance of at least 7

## Reece Wood Sole Acts as Splint



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—Men's

for

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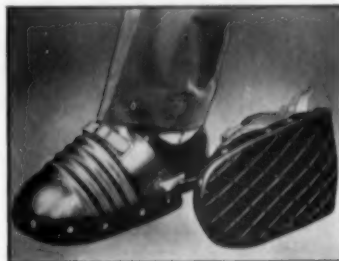
The metal shield (above) is designed to furnish a maximum amount of protection to the entire front of the foot—not merely the toes alone, but also to the instep against hazards from falling, rolling or flying objects, or from accidental tool blows.

IMPROVED FOOT GUARD EQUIPPED WITH FULL SOLE (right). These soles extend the entire length of the guard, are made of durable rubber, are flexible and comfortable. They have an anti-skid tread and a flange around the guard that prevents dirt and other substances from working up inside the guard.

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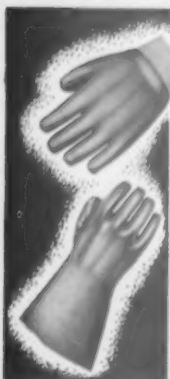
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feet should be provided, especially over aisles, passageways and stairways. Where this is not practicable, overhead obstructions should be marked by contrasting paint or should be padded to reduce possibility of injury.

Storage space must be adequate to avoid confusion, bad housekeeping, fire hazards, overloaded floors, and damage to stock.

Supplies, tools, safety equipment, small parts, and equipment not used regularly should receive attention. Maintenance is facilitated when such items as personal protective equipment, ladders, and hoisting equipment are readily available.

**Safe access** to all parts of the plant should be provided. Stairways are first choice where conditions permit. Fixed ladders may be used where space is limited. Portable ladders are acceptable only when the need for access is relatively infrequent.

Stairs for general use should be convenient to the areas served. They should be equipped with standard handrails and there should be no obstructions at top or bottom.

**In-plant traffic.** Planning for the movement of power trucks and trac-

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tors, hand trucks and tractors in and about buildings requires provision for adequate clearance in aisles, corridors, passageways, and at corners and curves.

Aisleways should be wide enough to permit trucks to pass one another without crowding and without endangering persons working at machines.

Sufficient width should be maintained for free movement of fire apparatus. For one-way traffic, aisles should be not less than two feet wider than the widest vehicle loaded. For two-way traffic, aisles should be not less than three feet wider than twice the width of the widest vehicle loaded.

Clearance must also be provided for overhead cranes and conveyors. At least 24 inches of clearance should be allowed the highest points of cranes and overhead trestles and other overhead fixtures. Also, 24-inch clearance should be allowed between any part of the crane and wall, column or other stationary structure.

Cross aisles should be avoided at tops and bottoms of ramps and inclines. If possible, aisle and ramp should be in a straight line.

**Pedestrian traffic.** Aisles should be proportionately wider to accommodate rush traffic flow to such points as time clocks, lunchrooms and exit gates. Main aisles up to 20 feet wide and cross aisles not less than 8 feet wide are provided in some plants.

Where foot traffic parallels railways or other fixed-track carriers, adequate clearance should be provided to allow the aisle edge to be marked by a conspicuous line on the floor. Aisles should be clearly

marked by painted lines or other marking.

Gates, warning signals or signs, and barricades should be provided. Where volume of traffic is heavy, underpasses and overpasses for both vehicular and pedestrian traffic should be considered.

#### REFERENCES

Plant Design and Construction  
National Safety Council  
Accident Prevention Manual for Industrial Operations, 1951. —Turn page

## THE "VEKI" SAFETY CAP

### Designed for Greatest Industrial Safety

"VEKI'S" larger, roomier, elastic-type snood is designed specifically for enclosing more hair than any conventional type cap . . . full protection for all hair all the time! Front of twill. Back is made of mesh—can also be had in solid or flameproof materials. Navy blue and brown. Other colors on request. Adjusts to all head sizes. 11 styles to choose from. Descriptive literature on request.



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—From page 189

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## Blocked Sale

—From page 10

because the old line safety equipment manufacturers always use it, so the firm that doesn't is a bit suspect.

"Second, because I know that the NEWS ads are screened by competent technical men on the staff of the National Safety Council, and that false claims are grounds for rejection of the ad.

"Third, because the National Safety Council is truly representative of the industrial safety men of this country, and I like to see its magazines supported by advertisers who live on industrial safety. I need the Council, and so does my company, and so do you and your company, whether you realize it or not."

The salesman opened his mouth to reply. Then he grinned.

"I've learned something," he said. "Thanks. Even if I haven't made a sale, I'm glad I called."

I said, "Maybe you have made a sale, anyway. We'll see."

At the door he said, "I'll pass the word on to the front office. About the ad—and about sending me to Florida for a vacation till they run one. I'll be back and see you."

"Do that," I said.

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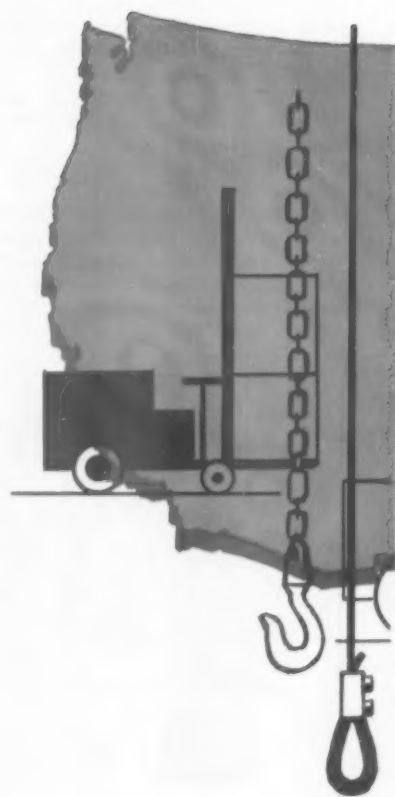
# MATERIALS HANDLING

EVERY manufactured product, by the time it reaches the consumer, has been handled many times—from producer to factory, through manufacturing processes, wholesaler and retailer. No wonder materials handling leads the list of sources of disabling injuries.

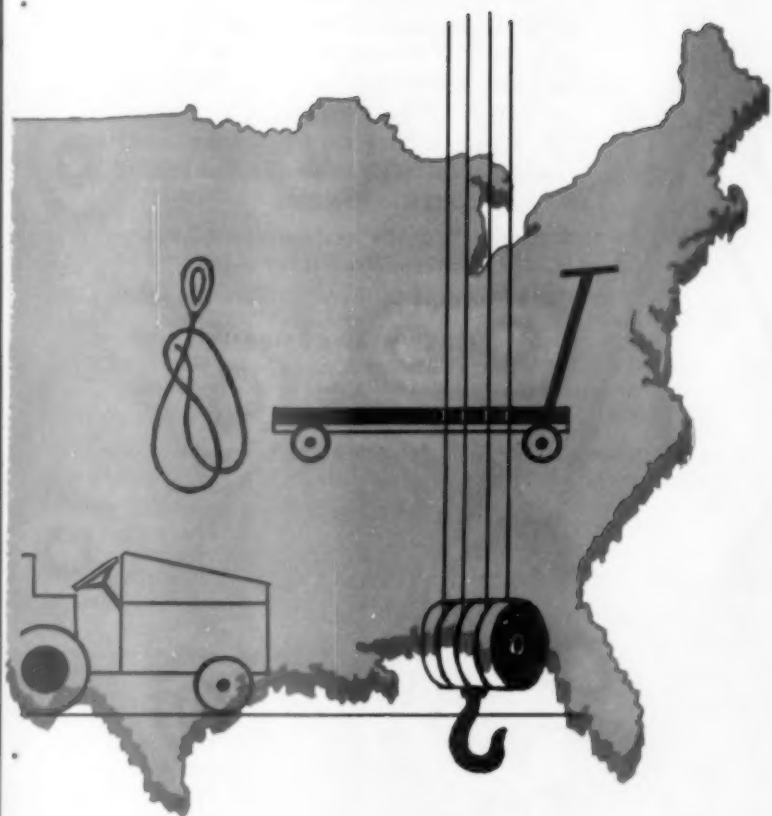
The most recent figures available to the National Safety Council indicate that handling objects accounted for 22 per cent of all disabling injuries. Among the sources of fatal and permanent total disability injuries it trails behind vehicles, falls, falling objects, electricity and machinery but it is involved in 26 per cent of the temporary total disabilities which account for a substantial amount of lost time and compensation payments.

Since each handling adds to the cost of the finished product in addition to offering more opportunities for injury, industrial engineering has been giving much study to simplifying material handling procedures to cut down the number of times an object must be handled and to substitute mechanical and automatic for manual methods wherever possible.

While mechanical methods and equipment avoid many of the hazards of manual handling, mechanization introduces some hazards of its own. Safety involves careful study of methods, selection of the right equipment, maintaining it in serviceable condition, and training employees in its use.



## MATERIALS HANDLING



7

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Wire Rope .....	199
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Fiber Rope .....	204

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Ask for Sling Catalog 5-8

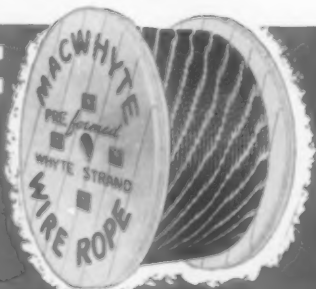
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# BASIC EQUIPMENT

**WHERE LARGE** quantities of materials move in more or less continuous flow in fixed paths conveyors, traveling cranes, railroads and elevators are used.

When goods move intermittently between many points in plant and yard, without regard to fixed limits, trucks, tractors and trailers are employed.

Portable types of equipment are needed in every plant. In the smaller establishments they serve all handling needs. In the larger industries they are useful auxiliaries to fixed systems.

This discussion will be concerned chiefly with portable equipment in common use, including:

1. Wheelbarrows
2. Hand trucks
3. Hand lift trucks
4. Powered hand trucks
5. Industrial power trucks
6. Hoists
7. Cranes
8. Conveyors
9. Slings and accessories—wire rope,
10. Miscellaneous equipment—Skids, pallets, steel strapping, grabs, tote boxes, bridge plates, dollies, etc.

## Load-Bearing Parts

Wire rope, chain and fiber rope are important wherever loads are lifted or hauled. These products are built to meet exacting specifications and their capacities are listed according to size, material and type of construction.

Slings made of these materials, and attachments, such as hooks, rings, etc., are designed to meet the needs of every hoisting job.

These parts are subjected regularly to heavy loads, sometimes overloads. They should be selected for the needs of the job and kept serviceable by regular inspection and maintenance.

## Unit Loading

Assembly of loads on skids, pallets or trailers to be moved from one part of the plant to another means less handling and more pieces per each handling. To move the load, it is only necessary for the truck to slide the platform or fork under the skid or pallet or to hook a tractor to the trailer.

A **skid** is a platform elevated from the floor by legs, casters or special attachments.

A **pallet** is a development of the platform skid. The most common

type is the double-faced wooden pallet with sufficient clearance between top and bottom to insert the forks of a fork truck for moving.

**Steel strapping** provides a secure method of fastening some types of bundled materials for shipping and for reinforcing packing cases. Workers need training in application and removal and should wear goggles and leather palm gloves for the work. Equipment available from suppliers should be used for applying and removing strapping.

Clamps of various types add to the usefulness of fork trucks. These can move and pile drums, bales and cartons without use of pallets.

## For Safe and Efficient Materials Handling

**Handle materials in large units.** A two-wheel hand truck is better than a man's hands. A four- or six-wheel hand truck is better than either. A fork-truck pallet combination is the most efficient system for many jobs.

**Avoid rehandling.** Every time you pick up materials and put them down again, it costs money and offers opportunities for accident. Arrange your system to cut down handling.

**Balance men and equipment.** Assign no more men and no more



Now they've done it! At last, the wheelbarrow has been motorized. This one is equipped with two drive wheels in front and a guiding caster wheel in rear. The tray is so balanced that the load is dumped by pulling a catch and lifting lightly on a handle. (Worthington Mower Co.)

equipment to a job than needed. Equipment sets the pace for men, not men for equipment.

**Select equipment suited to the job.** Study operations. Find out what equipment is needed and standardize on that. Nature of facilities, floor load capacity, ceiling height, volume of material to be handled, intermittent or steady flow, commodity characteristics, and strength of package all have to be considered.

**Move materials in a straight line.** Flow of materials should always be toward destination. Lay out work areas to reduce back and cross hauling.

**In storage,** items with greatest activity should be warehoused nearest to entrances and exits.

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## PLANT TRUCKS AND TRACTORS

**WHEELED VEHICLES** of many kinds, both hand and power operated, keep goods moving in factories, warehouses, docks and railroad terminals. There are types for every hauling or lifting job.

**Wheelbarrows** are useful for hauling and dumping bulk materials. They can be used where a two- or four-wheeled vehicle could not be maneuvered. Bodies of aluminum and magnesium alloys and rubber tires have made them lighter and easier to handle.

**Hand trucks.** The two-wheeler, designed for handling bags, drums, barrels, cartons, beverage cases, etc., comes in a variety of sizes and types. It can be equipped with brakes.

Hand platform trucks are available in several designs with capacities for 150 to 2,000 pounds. They are usually designed to be pushed by one of the end racks. They are suitable for short hauls.

**Hand lift trucks.** The load, supported on platforms or skids, is raised enough for horizontal movement and pulled by hand power. These are useful where loads are relatively light and distances short.

### Power Trucks

Power units for moving materials are operated by gasoline engine or

storage battery. The type of truck used should comply with fire protection regulations for the location.

**Powered hand truck.** Similar to hand lift truck. Power for operation is supplied by storage battery. A motor mounted on the forward wheels supplies power for hauling. The truck is controlled by a walking operator.

**Platform truck.** Used for hauling baggage, mail, and packages of railroad stations and steamship piers. In industry it hauls tote boxes and miscellaneous materials. Loading is by hand.

**Low-lift platform truck.** Platform elevates just enough for horizontal movement. It picks up loaded skids, moves and sets them down in other location without manual handling or use of other handling equipment.

**High-lift truck.** A load-carrying truck, with lifting mechanism designed to permit tiering one load upon another. Brakes give operator control of lifting device and platform at all elevations.

**Fork truck.** This is one of industry's most useful pieces of materials-handling equipment. It is a cantilever type self-loading truck with vertical uprights and elevating mechanism. Forks require less clearance than

shallow pallets as well as skids. Double-faced pallets afford a wider load distribution, which is an advantage in tiering.

In addition to moving and lifting palletized loads, attachments permit handling a variety of packaged and bulk materials. Clamps permit moving cartons, bales and drums without pallets and dumping attachments are used for discharging liquid, solid and granular materials.

**Canopy guards.** Where fork truck operators are exposed to danger from falling objects, the truck is required by code to be equipped with a canopy guard, strong enough to support a capacity load and have no opening larger than the smallest package carried.

**Scoop trucks** shovel loose materials and elevate and dump them into hoppers or bins.

**Ram trucks** handle wire and strip metal in large coils. Roll-handling trucks for handling newsprint or other paper are equipped with a cable drum with two cables. Hooks on the cables hook over the ends of a rod which serves as an axle for the roll.

**Crane trucks** equipped with boom, cable and drum, with special lifting hooks, spreaders and slings are used for moving heavy unit loads and objects too large to be handled on truck platforms or forks.

**Portable elevators** (tiering machines or stackers). The portable elevator consists of an upright frame to which is mounted a platform that can be raised or lowered. It is moved from place to place manually. The hoisting mechanism can be either manually or power operated.

Portable elevators are used in warehouses for piling and storing materials. They should be equipped with a braking device to permit the safe lowering of the platform. A ratchet lock or dog should be provided to lock the platform in position during loading and unloading.

Safeguards include limit stops for top and bottom travel limits on the hoisting cable drum, as well as for the shipper rope, if one is provided. When in use, casters should be lifted off the floor.

**Tractors and trailers** are used where large quantities of materials must be moved over relatively long distances, as at freight terminals and piers. Loading and unloading is done manually or by crane or other external means.



Moving a palletized load of cartons with a fork truck. These trucks will operate in fairly narrow aisles. With attachments they will pick up, transport and lift a variety of packages as well as materials in bulk. A canopy protects the operator when loads must be lifted above his head.

## HOISTS AND PORTABLE CRANES

A **HOIST** is a mechanical device, suspended from overhead, used for raising or lowering loads through a vertical plane. Common types of hoisting apparatus include:

1. Block and tackle
2. Hand chain hoist
3. Electric hoist
4. Air-operated hoist
5. Portable floor cranes
6. Jib cranes

**Block and tackle.** Blocks threaded with fiber or wire rope are used for suspending scaffolds, raising objects, and other industrial purposes.

When used to lift heavy materials or to hold loads suspended, as on heavy duty scaffolds, steel cables should be used. Steel cable requires a hoisting mechanism.

**Hand chain hoists** may be used where overhead cranes cannot be installed on account of lack of head room. They also handle heavy pieces at machines. One hoist may handle the work at one or more machines.

Steel is recommended for load-sustaining parts. It withstands sudden shock better than cast iron and is much lighter in weight for equal strength. Chain should be of best quality steel and should be welded.

Each hoist should be equipped with a braking device which automatically locks the load when hoisting is stopped.

Chains and sheaves should be lubricated at intervals, depending on atmospheric conditions.

**Electric hoists** range in capacity from  $\frac{1}{4}$  ton to 20 tons. They are

faster than hand hoists and less fatiguing for large loads. The light duty hoist uses link chain for lifting. The heavy-duty type uses wire rope.

Limit stops prevent the hoist from traveling too far in case the operating handle is not released in time.

**Air hoists** operate on compressed air. They are used where sparks from electric equipment might be a hazard, or where smoothness of operation is important. The air hoist is limited in travel because of dependence on the air lines.

**Grabs, grips and tongs** of several types have been developed for use with overhead handling equipment, such as cranes, monorails, hoists, etc. Some can handle a variety of objects while others are more specialized.

**Portable floor cranes** or hoists are mounted on wheels and can be moved either by hand power or under their own power. These raise and lower loads in a vertical line. They will not rotate around a fixed point.

Portable cranes are useful in plants where overhead belting, shafting, etc., prevent the use of overhead cranes, and where service is not frequent enough to justify more expensive equipment. The lifting mechanism may consist of a winch with wire rope and block, or a chain hoist, operated by hand or by electric power.

Hoists operated by electric power should be effectively grounded to prevent shock in case of short circuit.

**Jib cranes** lift, lower and rotate loads within the circle covered by a rotating arm or jib upon which runs a trolley. The jib is usually supported from a wall or column. A hoist, hand-operated air or electric, is suspended from the trolley. A substantial stop at the end of the jib arm prevents the trolley running off.

### Power Truck Operation

Which end of an industrial power truck is the front? Which is the rear?

Most manufacturers call the platform part of the truck the front, and many users follow the same practice. Points in favor of this method of operation are:

1. The operator is facing his controls and can act quickly in an emergency.
2. He can watch the load on the platform better in negotiating narrow passageways and aisles.
3. He has a better chance of escape in case anything goes wrong.

Advantages of riding ahead of the load are:

1. The operator will be more careful to avoid hitting anything because injury is more likely to occur.
2. He can see ahead much better.
3. He can negotiate corners and have a better clearance. He is in a better point of observation, particularly at blind corners.

Manufacturers have varying ideas of what controls should be used, and, consequently, in some plants, the operator may be confused because he is required to operate a truck with one type of control and then change to a truck with a different system.

A good start would be standardization of the warning signal button. Some trucks use a foot button, some a finger button, others a button which the operator depresses with his knee or thigh.

An operating platform guard is necessary. Some companies favor merely a bumper type guard, while others prefer a higher guard which comes almost to the knees of the operator. A third group prefers a guard which shields the operator to his waist.

Such guards should be completely enclosed in the back, leaving one or both sides open so that the operator may easily climb in or out.

Guards are usually made of heavy sheet metal and are sometimes reinforced with an angle-iron frame. In addition to the sheet metal guard, an angle iron is sometimes placed around the outside of the guard to allow about two inches clearance between the guard and anything it may bump against. This additional guarding will prevent the operator from getting his fingers mashed between the guard and any object he might strike.

Education of operators is a most important step. Only by constant education and by programs of strict enforcement can reckless driving be curbed.

### Crossover Bridges

Where loading docks are separated by railroad tracks, crossover bridges are needed. Some are of the draw-bridge type; others are mounted on four pillars that can be raised or lowered quickly by push-button control.



A portable crane can go anywhere in the plant and handle a variety of loads. (Unit Manufacturing Co.)

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# WIRE ROPE

**WIRE ROPE** provides high tensile strength and moderate flexibility for heavy lifting and haulage and for supporting rigging. It is serviceable under varying weather conditions but it should not be exposed to excessive heat or corrosive substances nor dragged over abrasive surfaces.

In selecting wire rope, the following should be considered:

1. Size
2. Construction
3. Grade
4. Equipment on which rope is to operate
5. Handling, installation and maintenance of rope

## Constructions

Wire rope is manufactured in a variety of constructions, each designed for certain service conditions.

In designating construction, the first numeral identifies the number of strands in the rope, the second, the number of wires in each strand. This is followed by a term describing the geometric arrangements of wires in each strand, e.g., 6 x 19 Filler Wire.

The 6 x 19 construction is the most generally useful. As the number of wires per strand increases, flexibility and reserve strength increase but ability to withstand abrasion decreases. A 6 x 7 construction has higher resistance to abrasion but less flexibility.

The core serves as a foundation for the strands. Three types of cores are used: (1) fiber; (2) independent wire rope, and (3) wire strand.

Fiber gives elasticity to the rope and has adequate strength for normal operating conditions.

Metal cores are used where maximum strength and minimum stretch are important, or where heavy loads or overwinding on a drum causes excessive pressure of strands against the core, or temperature would dry out a fiber core.

**Type of Lay.** There are two general methods of laying up rope: (1) Regular lay in which the wires in the strands are laid in the opposite direction to that of the strands in the rope, so that on the outside of the rope the wires lay approximately parallel to the rope axis; (2) Lang lay rope, in which the wires and strands are laid in the same direction.

Regular lay rope is standard for most applications. It is easier to handle during installation and less susceptible to kinking.

Lang lay rope has good flexibility and high resistance to abrasion and fatigue.

Wire rope is made either right or left lay. In most cases it makes little or no difference which type is used. Right lay is standard.

## Rope Grades

Rope wires are usually made of the following materials and designated by their names. (Minimum tensile strengths are quoted from Federal Specifications RR-571 a.)

**Improved plow steel.** Has highest strength and toughness and most wear resistant properties. Most frequently selected for heavy duty service, as in deep shafts and on excavating machinery. Minimum tensile strengths, 218,000-244,000 p.s.i.

**Plow Steel.** Strength about 15 per cent less than improved plow steel. Serviceable for haulage, hoisting, logging and miscellaneous service. Minimum tensile strengths, 190,000-212,000 p.s.i.

**Mild Plow Steel.** Combines toughness with pliability, making it capable of undergoing repeated impact stresses. Used principally for cable tool drilling. Minimum tensile strengths, 165,000-184,000 p.s.i.

**Cast Steel.** Where strength is not the controlling factor, its pliability is important in long fatigue life. Resistant to acid mine water. (Not listed in Federal Specifications.)

**Traction Steel.** Used in hoisting ropes for traction type elevators. High resistance to bending fatigue and minimum abrasive action on sheaves and drums. Minimum tensile strength, about 160,000 p.s.i.

**Iron.** Low tensile strength (about 70,000 p.s.i.) but very ductile. It has been used principally in elevator service where it is being replaced by traction steel.

**Corrosion-resisting metals.** Where corrosion is a factor, stainless steel, bronze and monel metal are frequently used. All-metal ropes are preferred to fiber core ropes.

Stainless steel is used in marine operations on aircraft, and where rope is exposed to alkali, acids of an oxidizing nature (such as nitric), neutral brine, food products, and temperatures damaging to carbon steel ropes.

Bronze is slightly stronger than iron rope. It is used frequently in marine service.

Monel metal is used where rope is exposed to marine atmospheres, acids of a reducing nature (such as sulfuric, muriatic and hydrofluoric), neutral brines, food products, pickling solutions, and aromatic chemicals.

Corrosion-resisting ropes are furnished in complete assemblies and slings with fittings attached. Tem-



Dragline cables used in dredge mine operations require wire rope of high strength. (American Chain and Cable Co.)

perature, humidity, nature and concentration of corroding chemicals should be considered in selecting equipment.

### Preformed Wire Rope

A preformed wire rope is one in which each individual strand, and at the same time each individual wire, is permanently formed into the helical shape it will assume in the finished rope. Advantages of preformed rope are:

1. Higher resistance to bending fatigue.
2. Greater flexibility.
3. Less susceptible to kinking and therefore easier to install.
4. More equal distribution of load on each strand and wire.
5. More resistant to whipping and vibration.
6. Hugs small drums better and winds more uniformly and smoothly.
7. Operates over sheaves with less rotation around its axis, with less wear on rope and sheaves.
8. May be socketed with less danger of unbalancing the lay of the rope below the base of the socket.
9. Does not unravel when seizings are removed from ends of rope.
10. When outer wires break through fatigue, they do not protrude or "porcupine." This reduces risk of injury in handling.

Since broken wires are less conspicuous in preformed rope, greater care is needed in inspection. However, broken ends separate slightly, permitting detection.

Strength and other qualities are the same for preformed and non-preformed rope of the same size, grade and construction.

### Wire Rope Slings

Wire rope slings are widely used for heavy lifting. Wire rope should not be used, however, where there are sharp bends over an unyielding surface. Tension of outside strands may cause damage to the rope.

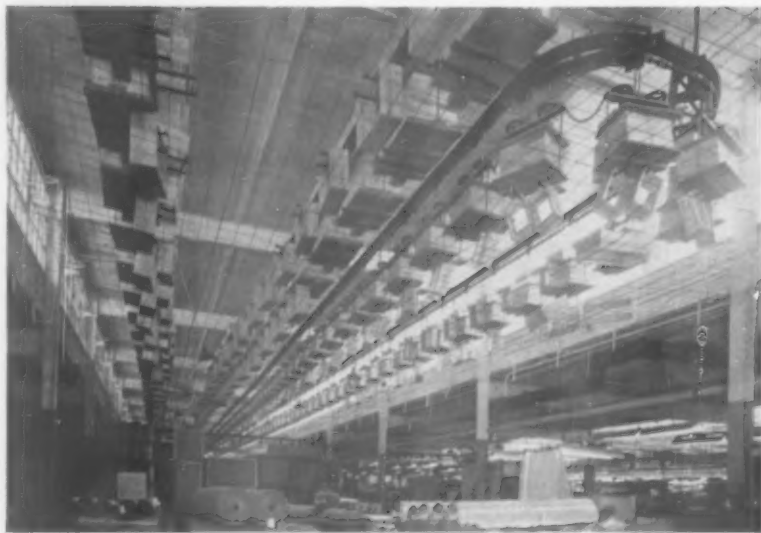
Where a load has sharp corners, pads should be placed between the load and the sling.

Maximum strength is obtained when all legs of the sling are vertical. The smaller the angle formed between the legs of the sling and the horizontal, the greater the tension on the legs and the less weight which can be lifted.

Selection and attachment of fittings have much to do with rope life and safety. Principal connections and attachments are:

- Babbitt or zinc socketed connections
- Wedge sockets
- Swaged attachments
- Thimble with clip connections
- Three-bolt clamp connection
- Spliced eye and thimble connection

## CONVEYORS



Overhead conveyors relieve congestion by taking much movement of materials from the floor. Guards protect workers below. (Link Belt Company)

**WHERE** material moves in continuous flow, power-operated and gravity conveyors eliminate much handling and many opportunities for injury.

Principal types are roller, chute, belt, chain, portable, screw, pneumatic, monorail, and overhead trolley.

For efficient and economical operation,

When slings are to be used for special purposes the advice of the manufacturer should be obtained.

### Causes of Failure

When wire rope fails to give the expected service, the reason is seldom a defect in the construction of the rope. Following are some of the more common causes:

1. Use of rope of incorrect size, construction or grade.
2. Allowing rope to drag over obstacles.
3. Lack of proper lubrication
4. Sheaves and drums of inadequate size, causing short radius bends.
5. Overwinding or cross winding on drums.
6. Sheaves and drums defective or out of alignment.
7. Ropes jumping sheave flanges.
8. Effect of heat, moisture, or acid fumes.
9. Improper fittings.
10. Permitting ropes to untwist.
11. Kinking

—To page 209

ation, fixed systems require thorough study of the plant's manufacturing and material-handling problems before installation.

Gravity conveyors are of two general types—chute and roller.

Power-driven conveyors should be equipped with emergency stopping devices located at convenient points.

Stile-type crossover bridges with handrails should be placed where needed. Side boards along edges and at turns of overhead conveyors and screen guards under high runs protect workers and equipment from falling material.

**Portable conveyors**, mounted on wheels or casters, can be moved where needed and are time, labor and back savers for short jobs. Both gravity and power-driven types are available. They are made in roller, belt and bucket types for handling packages and loose materials. They are often used at warehouse, docks, shipping platforms, coal yards, and sand and gravel pits.

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# CHAINS AND CHAIN SLINGS

**CHAINS AND ATTACHMENTS** made according to modern standards have strength, flexibility and resistance to abrasion, heat, shock and corrosion. These qualities make them suitable for heavy hoisting and haulage jobs.

Specifications for various types of chain have been compiled by the American Society for Testing Materials. Safe loads may be determined from tables in the manufacturers' handbooks.

**Safe working load** means the maximum load which should be applied to a chain in direct tension.

**Breaking loads** are of no practical interest to the user. They are often misleading and may encourage unsafe practices.

**Proof test** means the actual test in pounds applied to the chain and attachments before leaving the factory. Proof test figures should not be considered as safe working loads.

These tests are followed by visual link-by-link inspection by experienced inspectors.

## Types of Chain

Conditions under which chain will operate should be considered in selecting types. When ordering, the manufacturer should be consulted about applications.

Factors to be considered are: impact loading, bumpy craneways, rapid lifts, sudden stops, heat, corrosive atmospheres, and unnatural strains.

Following are types commonly used in industrial operations:

**Wrought iron chain** (crane or dredge) has high resistance to shock fatigue and corrosion. This chain has close links and is used for slings, hoists, cranes, power shovels, and marine purposes where human life and property depend on its endurance.

**Welded steel chain** (low carbon) is made in three common types: Proof Coil, BBB, and Steel Loading.

Proof Coil is used principally for towing, binding, logging and similar operations. Links are comparatively long. Proof coil chain is not suitable for lifting or for slings.

BBB Coil is a higher grade than proof coil, with safe working load approximately 25 per cent greater.

Shorter links give greater flexibility. BBB coil chain is not suitable for lifting or for slings.

Steel loading chain has a tensile strength approximately 50 per cent higher than BBB. It is used in the logging industry for binding and loading logs and in oil fields for handling pipe and heavy equipment.

**High test chain** (high carbon) is heat-treated to give it high tensile strength and resistance to impact loads. Tensile strength is approximately double that of ordinary steel chain. Ductility is moderate. Where resistance to wear is most important, it permits use of smaller and lighter chain.

**Alloy steel chain** (general purpose) has exceptional strength for weight and size. It is resistant to some types of corrosion. It is frequently used where maximum tensile strength and resistance to abrasion is required, with reasonable resistance to impact.

**Special purpose alloy chain** is considerably higher in cost and is used on high temperature operations and where resistance to the action of corrosive substances is required.

Stainless steel is high in tensile strength, fair in elongation, but low in impact resistance. It is used chiefly for ornamental installations and nitric acid pickling.

Monel has fair tensile and impact strength and elongation. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Bronze has good elongation and fair resistance to impact, but low tensile strength. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Specialized types of chain have been developed for certain industries, such as those used in marine operations.

Finishes are sometimes added to chains to provide added protection from corrosion or for decorative effect.

Nickel alloy steel hoisting chain is approximately twice as strong as iron chain of the same size. It meets ASTM elongation requirements for iron crane and proof coil chain. It can be used over a wider range of temperature and is relatively immune to failure resulting from fatigue stresses and cold working of the metal.

Impact resistance in heat-treated alloy steel chains does not increase in proportion to the strength of the chain. Under full working load they will fail under impact before a fully loaded wrought iron or heat-treated carbon chain will fail.

Because of wear and impact factors, some chain manufacturers recommend that link size of sling chains should not be greatly reduced when using alloy steel chains of high strength as compared with wrought iron chain. Longer life and increased factor of safety justify increased cost.

**Storage.** When not in use, each chain should be hung on a rack or placed in a neat pile on a dry floor or platform where it will not create a tripping hazard. Exposure to corrosive fumes or liquids should be avoided.

**Safe Loads.** Some plants stamp on a metal tag attached to each chain the safe vertical load which may be lifted with that chain. A better way is to stamp the safe load, or a reference number, on the ring or hook. Stamp marks should not be placed on links where they might form points of weakness.

The useful life of all material handling equipment, particularly rope and chain, is shortened by overloading, jerking, and neglect of maintenance.

## Chain Slings

Slings should preferably be purchased complete from the manufacturer. All attachments should be made to proper dimensions and of material specified for various uses. An ample factor of safety should be provided.

When a sling requires repair it should be sent to the manufacturer.

Rings and hooks are as important as the chain and should receive the same attention in inspection and maintenance.

A hook bent by overloading should be replaced. The stress of bending weakens metal so that its strength cannot be restored by repairing.

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# FIBER ROPE

**FIBER ROPE** is flexible and easy to tie and splice. It can be handled manually. These qualities make it suitable for block and tackle work, life lines and lanyards, suspended scaffolds and stagings, and in marine operations.

Many types of fibers have been used for ropes. The best materials have good tensile strength and resistance to weather and abrasion.

For heavy loads where fiber rope of adequate strength would be too bulky, wire rope is more serviceable.

Fiber rope should never be exposed to high temperatures or to acid splashes or fumes. Sharp bends should be avoided. Where a sling passes over sharp edges, pads should be used to protect the rope.

Rope should not be kept in stock for long periods. Even with careful handling and favorable storage conditions, vegetable fibers deteriorate with age. When rope is used at infrequent intervals, its age should be considered in its use and retirement.

## Natural Fibers

**Manila fiber** is standard for tensile strength and durability. A good grade of new, clean manila rope is hard but pliant, yellowish in color. It has a smooth almost silky feel.

**Sisal** is the next best fiber. Strength varies from 65 to 80 per cent of manila. Sisal rope has a yellowish color, with sometimes a slight greenish tinge. It lacks the gloss and smoothness of good manila. Sisal fibers are stiff with a tendency to splinter.

**Mexican sisalana** (henequin) lacks the strength of high quality sisal but has been used to some extent during shortages of better grades of rope. Strength is about 60 per cent of manila.

**American hemp** fiber is much softer than manila. It has a dark gray color. It is not highly resistant to abrasion but when tarred it will give fair service on some jobs. Strength is about 80 per cent of manila.

**Jute and cotton** are not recommended for handling material or other uses where strength and du-

ability are needed. Strength is about 50 per cent of manila.

## Synthetic Fibers

Ropes of synthetic fibers are coming into wider use. Their higher cost has restricted their use to certain specialized operations.

**Nylon** has a high rating for tensile strength, toughness, flexibility and durability. It is easy to handle.

Nylon rope has a higher tensile strength, wet or dry, than natural fibers and does not show marked deterioration when frozen. Melting at 480 degrees F., it can be readily destroyed by fire but it does not ignite and burn with flame. It is resistant to rot, mildew and alkalis but is damaged by acids.

**Glass fiber.** High strength when dry but low resistance to flexing and abrasion. Poor performance when wet reported.

**Saran.** Resistant to rot and many chemicals. Practically unaffected by aging, direct sunlight and moisture. Only moderate resistance to abrasion and temperature.

## Care of Rope

New rope should be thoroughly inspected throughout its length before being placed in service. The rope should be uncoiled by laying

the coil on the floor with inside end down; then reach down through the center of the coil and pull this end up, unwinding the coil counterclockwise. If the rope uncoils in the wrong direction, the coil should be turned over and the end pulled out on the other side.

Rope loaded over 75 per cent of its breaking strength will be permanently injured. Damage can be detected by examination of inside threads which will be broken in proportion to the overload.

**Kinking** is highly destructive to rope. It may cause failure when the rope is again put under strain. Kinking is more likely to occur when rope is wet.

Sometimes ropes become kinked after use. One method of removing these kinks is to open up the coil and recoil left-handedly. When the coil is completed, the free end is brought through the coil and the rope is then coiled right-handedly.

Uncoiling the rope and stretching it out in a single length is another method of unkinking where space permits.

Rope should be stored in a dry place where it will not be exposed to high temperature and where air may circulate through the coils.

Rope deteriorates very quickly if it becomes saturated with water and is not properly dried. Alternate wetting and drying will also cause rapid deterioration.

When lengths of rope must be joined, they should be spliced, not knotted. A well-made long splice will retain up to 90 per cent of the strength of the rope; a knot only 50 per cent.

**Inspection** should include examination of the entire rope for wear, abrasion, broken or cut fibers, displacement of yarns or strands, discoloration or rotting.

To inspect the inner fibers, the rope should be untwisted in several places to make sure the inner yarns are bright, clear and unspotted.

Rope should be replaced when it has lost its feel of pliability or stretch, or when the fibers have lost their luster and appear dry and brittle.

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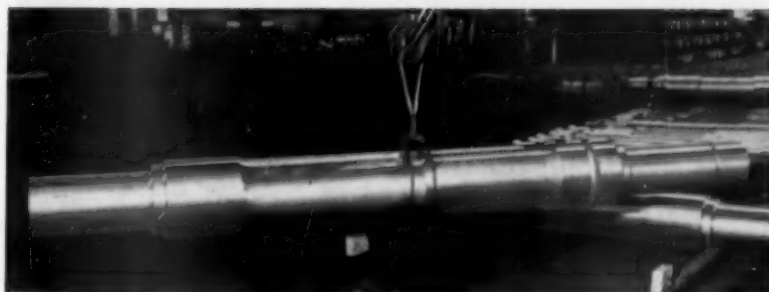
"Sailor's hook" makes it unnecessary to fasten and unfasten knots every time the position of a scaffold or bosun's chair is changed. (Structural Safety Service, Inc.)

# Slings for the Touchy "Special" Jobs

Perhaps your plant is one of the many requiring unusual slings for specialized handling jobs. If so, we think we can help you work out all the details. Then our modern shops will fabricate the slings to specifications.

Two such jobs are shown on this page. One is the handling of a big, heavy piston. Bethlehem Torpedo slings were chosen, with the added specification that part of the slings be neoprene-covered. The other photo shows a forged-steel axle being lifted by a braided sling, each of whose ends is reinforced by a sturdy arc-thimble.

Bethlehem makes special slings in every type you'll ever need. The ones pictured here are but two of the many recent examples produced by our shops. You might find them helpful in your



own particular set-up. But if your requirements run along different lines, we can design and manufacture the units that will prove most suitable. And don't forget, all kinds of standard slings are also available from Bethlehem—regular grommet, braided, sin-

gle-part, bridle, and other types.

Please feel free to call in one of our engineers whenever you need some help in planning lifts. No matter how involved the study may be, you'll find the Bethlehem man well qualified to aid you with your problems.

**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

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**BETHLEHEM WIRE ROPE SLINGS**  
**MAKE THE TOUGH LIFTS EASY**



## ACCESSORIES FOR MANUAL HANDLING

**IN SPITE OF** the development of power equipment for handling material, much manual handling is still necessary. There are numerous accessories which make the work safer and easier, if these devices are kept in good condition and used correctly.

**Hooks** are used for handling logs, lumber, crates, boxes and barrels where the object will not be damaged. Hooks should be inspected daily and kept sharp. If a hook is carried in the belt, the point should be covered. The worker should be trained to use the hook so that it will not glance off hard objects.

**Bars.** The point or edge of a crowbar should be kept sharp and position of hand and body should minimize the chance of pinching or falling if the bar should slip or the object move suddenly.

**Car movers,** not crowbars, should be used to move cars on steel rails. When two men are needed for the job, two car movers should be used. More than one man should not try

to work with the same mover.

**Rollers** are used for moving heavy, bulky objects. A sledge or bar, not hands or feet, should be used to move rollers under the load.

**Hand trucks, wheelbarrows, and dollies.** These devices are on the borderline between mechanical and manual equipment. Even simple equipment should be inspected regularly and kept in repair. Axles should be kept well lubricated. Repair and maintenance records should show the condition of each piece of equipment.

The type of truck most suitable for the work should be used. No one type of truck is suitable for handling all types of loads.

On a two-wheeled truck, the center of gravity of the load should be placed well forward so that the weight lies on the axle and not on the handles. Two-wheeled trucks may have brakes so that the worker need not hold the truck with a foot on the wheel or axle.

Two-wheeled trucks and wheel-

barrows may be equipped with knuckle guards to protect the hands from jamming against obstructions.

Tongues of flat trucks may be provided with counterweights, springs, or hooks to hold them vertical when not in use. Otherwise workers should be trained to leave handles in a position that will not create a tripping hazard.

To decrease the hazard to feet, wheels should be as far under the truck as possible. Wheel guards may be installed on some types of trucks.

Four wheel trucks should be pushed, not pulled, particularly when the truck is going down an incline.

### Handling Specific Objects

Drums and barrels can be handled more safely on an incline with ropes or other tackle to control their motion. The drum or barrel should be snubbed with a rope, one end of which is securely fastened to the platform from which the object is to be lowered. The rope should then be passed around the drum and the load lowered gradually.

Sheet metal should be handled with leather gloves, hand leathers, or gloves with metal inserts. Bundles of sheet metal should be handled with power equipment.

Sheet glass should be handled with gloves or hand leathers, and wrists and forearms should be covered with long leather sleeves. A leather or canvas apron and guards to protect feet and ankles should also be worn.

Large panes of glass should be handled by two or more men, using canvas slings and padding to protect head, neck and shoulders. Where large panes are carried a considerable distance, an A-frame truck should be used.

### Fire Hazards of Industrial Trucks

Industrial trucks—ram, fork or crane type, can be powered by gasoline engines, liquefied petroleum gas, gasoline-electric power units, or storage batteries. These power plants present a definite fire hazard.

Each industrial truck should be equipped with a 2½-pound carbon dioxide extinguisher; a 4-pound gas-pressured dry chemical extinguisher, or a 1-quart vaporizing liquid extinguisher. These sizes are the smallest approved for industrial use.

Gasoline trucks should be refueled in a safe location, away from storage and manufacturing areas—

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preferably outdoors. The engine should be shut off during refueling and care exercised to avoid spilling fuel or overflowing the tank.

Collisions also cause damage. Lift trucks have been known to break sprinkler pipes, causing heavy damage to stock.

### Protecting Timber in Storage

**SERIOUS** losses from decay in wooden structures are often due to infection of timbers with wood-destroying fungi while in storage. These losses can be greatly reduced by keeping lumber yards in a sanitary condition. Following are some precautions recommended by Forest Products Laboratory:

**Store on well-drained ground**, removed from possible dangers of floods and standing water.

**Remove debris, keep down weeds.** All rotting debris scattered about yards should be collected and burned. In yards already filled in to considerable depths with sawdust and other woody debris the situation can be improved by a heavy surfacing with soil, slag, or similar material. Weeds should be cut away from piles to allow ventilation.

**Use proper foundations.** Provide ventilation beneath stacks. Solid foundation should never be used. In humid regions stock should be piled 18 to 24 inches from the ground.

**Wood blocking** used in direct contact with wet ground should be protected by application of creosote or other wood preservative or replaced by concrete, brick, or other durable materials. Treated skid timbers are also advantageous.

**Slope lumber piles.** Foundations should be built so that the piles will slope approximately 1 inch to every foot of length.

**Avoiding close piling in the open.** In most regions lumber should not be close piled in the open, but should be "stuck" with crossers at least 1 inch thick. Lateral spacing is also desirable. Roofing of cover boards on the piles should extend for several inches in front and back.

**"Stickers."** Instead of throwing "stickers" about on the ground to become infected with decay, they should be handled carefully and when not in use piled on sound foundations and kept as dry as possible. Pine saturated with resin, and

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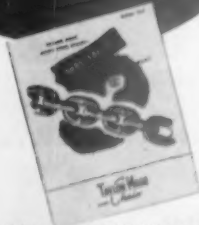
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heartwood of such durable species as white oak or red gum are resistant to infection.

**Keep sheds dry and well aired.** In storage sheds the necessity for piling higher from the ground is apparent. Sheds should be tightly roofed and siding should not be run down below the bottom of the foundation sills. Free air circulation should be allowed from all sides beneath enclosures. Only thoroughly dry stock should be stored in close piles under cover.

**Check fungous outbreaks.** Should fungous outbreaks occur in sheds, the infected foundation timbers should be torn out and replaced with wood soaked in a fungicidal solution, or by concrete or brick.

New foundations should be constructed to keep lumber well off the ground, and soil and timber adjacent to the infected area should be sprayed or painted with a germicidal solution such as sodium fluoride, mercuric chloride, zinc chloride, or copper sulphate.

### How Much Should A Person Lift

Physical differences among individuals make it impractical to set up safe lifting limits for all workers. Height and weight do not necessarily indicate physical strength.

State codes limiting the load a worker may be required to lift differ widely. Each employer should know the provisions of his own state code.

The following weights have been set up by the U. S. Department of Labor as within the safe limits for male and female workers required to perform continuous or repetitive lifting operations:

Male—50 pounds in compact form.

Female—25 pounds in compact form.

Heavy objects, like lathe chucks, dies, jigs and fixtures, should be stored at approximately waist height.

Where lifting must be done continuously, even though the weights may be within safe limits, mechanical handling equipment may reduce fatigue and speed up work.

Keeping bearings properly lubricated will prevent overheating, a cause of many fires in oil or lint deposits at the bearings.

Cleanliness around steam pipes is important. Prevent accumulations of dust, lint and other finely divided material that might ignite.

## Wire Rope

—From page 200

12. Severe overloads, reverse bends, and other excessive stresses.
13. Internal wear caused by grit penetrating between stands and wires.

### How to Order

When ordering wire rope, the following information should be furnished:

1. Length.
2. Diameter.
3. Construction—Number of strands; Number of wires per strand; Arrangement of wires in strand, such as Seale, Filler Wire, etc.
4. Type of Fabrication—If preformed rope is desired, it should be specified. Otherwise, non-preformed rope will be furnished.
5. Finish—Galvanized finish should be specified if required. Otherwise bright rope is usually furnished.
6. Grade—Improved plow steel, Plow Steel, Iron, etc.
7. Lay—Regular Lay Right Lay will be furnished unless otherwise specified. Lang Lay or Left Lay is furnished on request.
8. Core—Specify fiber core, inde-

pendent wire rope core, or wire strand core.

9. Lubrication—Type of lubricant should not be specified unless there are unusual service requirements. Each construction and grade of rope is treated with a lubricant adapted to that particular rope for a wide range of service conditions.

10. Use for which rope is intended.

### Wire Rope Lubrication

All wire rope should be treated at regular intervals with a lubricant to keep it pliable and to prevent rust. Pound for pound, wire rope probably has more bearing surface (inside the rope) than any other equipment, so the importance of lubricating is obvious.

Idle wire ropes are most susceptible to damage by rust. It is important to see that they are well lubricated when not in service.

The best lubricants are those fur-

nished by manufacturers and dealers especially for lubricating wire rope.

Lubricants which meet specifications are free from acids and corrosives and have good penetrating qualities. They do not cake, gum or ball-up if contaminated with dirt or metal particles.

Lubricant may be applied with a brush. It should be brushed on slowly, carefully and frequently because it is difficult to get complete coverage and penetration.

A more effective method is a simple three-sheave trough. It should be firmly fixed near the reel or drum and the rope run through the lubricant not faster than 30 feet a minute.

### REFERENCES

- National Safety Council**  
Steel Sinews—Safety Reprint Con. 5.  
**National Safety News**  
How Safe Are Your Slings?—W. C. Richards, Aug. 1953.  
Know Your Wire Rope—B. N. Carlson, Feb. 1949.  
You Can Depend on Wire Rope—Sept. 1954.  
**Miscellaneous**  
Wire Rope, Simplified Practice Recommendations No. 198-43,—National Bureau of Standards.  
Wire Rope, Federal Specifications RR571a.

### WIRE ROPE STRENGTH

Grades	Breaking Strength (Lbs.) of $\frac{1}{2}$ " Rope
Iron	12,500
Traction Steel	23,000
Mild Plow Steel	24,600
Plow Steel	28,300
Improved Plow Steel	32,600

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# MACHINE OPERATION and GUARDING

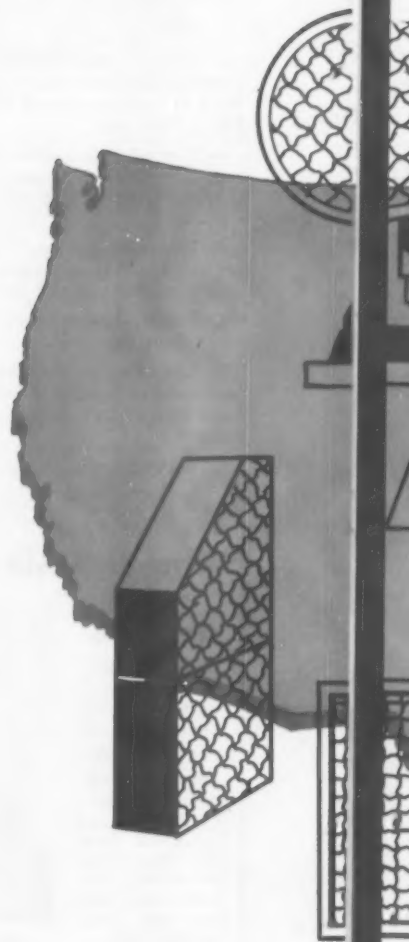
**MACHINERY ACCIDENTS** account for some 32 per cent of all permanent partial work injuries and approximately 9 per cent of the fatal and permanent total disability injuries. They form about 16 per cent of all compensable injuries.

Electricity is not listed separately among occupational accident sources in *Accident Facts*. Electricity, explosions, heat, etc., as a group are involved in 9 per cent of the fatalities and permanent totals.

Hand tools, which are included in this section, account for approximately 7 per cent of all compensable injuries.

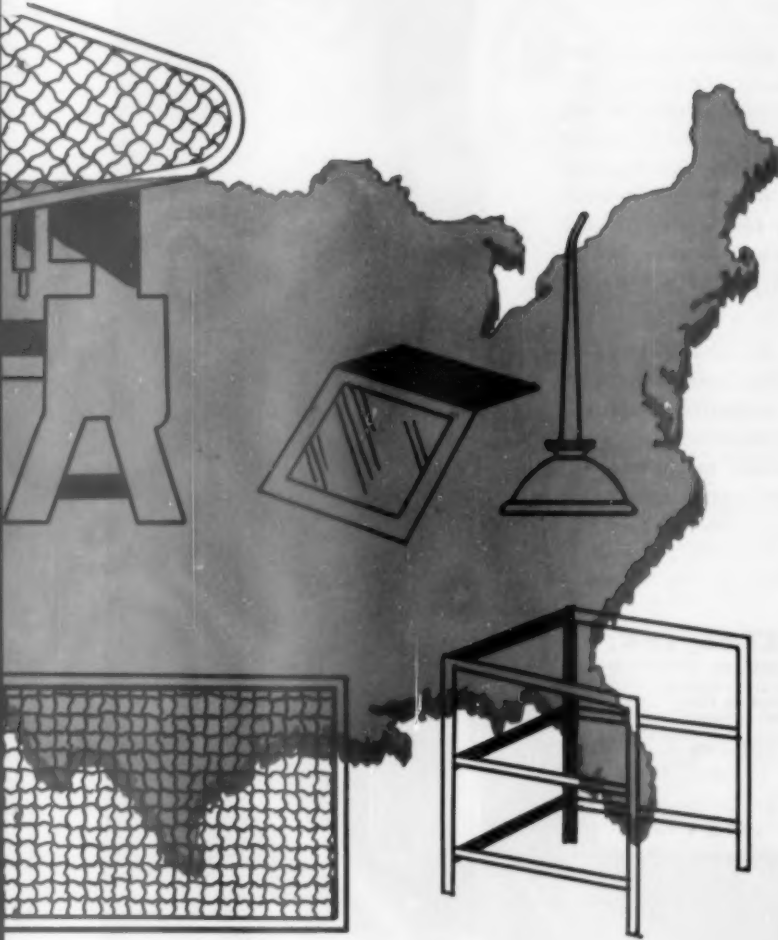
Much attention has been given to machine guarding and many types of effective safeguards have been developed. Progress, however, has been handicapped by the variety of machines and operations performed on them as well as by lack of uniformity in the requirements of various states. Much has been accomplished in this direction through the development of voluntary safety codes under the procedure of the American Standards Association.

In spite of the progress that has been made there is still much substandard machinery in operation. Much of it is inefficient according to modern ideas and each year much of it wears out and is replaced by equipment of better and safer design.





# MACHINE OPERATION and GUARDING



8

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Lubrication . . . . .	228

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for every job where fire can occur!

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For tools to be used in the vicinity of acetylene or similar gases — specify Ampco Monel† Tools.



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†T.M. International Nickel Co.

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# GUARDING THE MACHINE

**MANY MACHINES** are quite safe for normal operation. It is quite unnecessary for an operator to place his hands in the danger zone but sometimes it is done. Guarding, therefore, must protect the individual against his own lapses as well as against the normal hazards of the job.

Machines now built with moving parts enclosed present a trim, streamlined appearance as well as greater safety. Pressure lubrication reaches remote bearings without exposing the oiler to hazard. House-keeping is also improved.

Color is a safeguard. Highlighting the point of operation with light tints which stand out against the darker background of the machine enables the operator to watch the work with less effort on the eyes. Strong colors which give warning when a guard is missing are also helpful.

Where built-in guards are not practicable, as in the case of older machines, or machines requiring special guards, standard types of commercial guards may remove the hazard. For such machines as power presses, circular saws, paper cutters, and others, guards have been designed for a variety of operations.

A guard which interferes seriously with output is not likely to be popular with either the operator or the management. Planning a guard, therefore, should be done in cooperation with the supervisor and the operator.

Some operations can be guarded effectively with guards available commercially. Others require custom-built guards developed through extensive study of the job by both operating and safety departments.

Among the machines involved frequently in accidents are wood-working machines, such as circular saws, jointers and planers, and power presses.

The majority of machine accidents occur at the point of operation—the area or point on a machine at which work, such as forming, cutting, etc., is performed on material being processed. Individual motor drives for machinery have eliminated much hazardous power transmission equipment and improved lighting and housekeeping.

Guard design must often be approved by state factory inspectors

and insurance engineers. Since state codes are not uniform and at best represent only minimum requirements, the codes and recommendations of the American Standards Association are the best guides.

## Point of Operation

Guarding the point of operation effectively is usually more complicated than enclosing power-transmission apparatus.

Point-of-operation guards are installed at those parts of machines where cutting, shaping or forming is performed, and at other points where there may be a hazard to operators inserting or manipulating stock.

Guards should protect operators both from moving machine parts and from moving materials. Safeguards are of the following types:

1. Automatic feeding and ejecting.
2. Two-hand control.
3. Redesign of machine parts so that it is impossible for the operator to get into the danger zone.
4. Devices that interrupt movement of tools or machines while any part of the body is in the danger zone.
5. Devices that pull or push hands away from the danger zone.
6. Barricades, covers, hood guards and other enclosures.
7. Interlocking devices.

## MECHANICAL APPARATUS INSPECTION

Check the points listed below. Make recommendations to cover unsatisfactory conditions so that they can be corrected promptly.

### POWER TRANSMISSION ENCLOSURES OR GUARD RAILS

Pulleys, flywheels . . . . .	<input type="checkbox"/>
Gears, sprockets, chains . . . . .	<input type="checkbox"/>
Belts: vertical, horizontal . . . . .	<input type="checkbox"/>
overhead horizontal . . . . .	<input type="checkbox"/>
Belt shifters . . . . .	<input type="checkbox"/>
Keys, setscrews, collars, couplings . . . . .	<input type="checkbox"/>
Shafting . . . . .	<input type="checkbox"/>
Clutches . . . . .	<input type="checkbox"/>
Lubrication facilities . . . . .	<input type="checkbox"/>

### CONTROLS

Electrical starting devices . . . . .	<input type="checkbox"/>
Lockout devices . . . . .	<input type="checkbox"/>
Tripping devices: foot, hand . . . . .	<input type="checkbox"/>

### POINT OF OPERATION GUARDS

In place . . . . .	<input type="checkbox"/>
Condition satisfactory . . . . .	<input type="checkbox"/>
Correct adjustment . . . . .	<input type="checkbox"/>

NSC Safety Instruction Card No. 778

## Power Presses

Safeguarding power press operations is one of industry's major accident prevention problems. Because of the many types of presses and the number of specialized operations performed, the subject is a highly complicated one. Fortunately, much material on press operation is available from National Safety Council, American Standards Association, U. S. Department of Labor, insurance companies, and other sources.

Automatic feed may make it unnecessary, but not impossible, for an operator to place his hand between the punch and the die. It is still necessary to provide a gate guard, enclose the ram, or limit its stroke to 1/4 inch or less.

For some operations, semiautomatic feeds are used. Principal types are: chute, plunger, slide or push, sliding dies, dial and revolving dies.

Two commercial guards adaptable to many operations are the sweep and pull-back types.

**Sweep guards** are best used on small presses. They are easily adjusted and give the same protection when the clutch fails as they do for a regular stroke of the press. A sweep guard is more effective when a flag of fiber or other material is placed on the sweep arm. This helps to prevent an operator reaching around the guard on one side, and on slow-moving presses from putting his hand between punch and die after the guard has swept past the center of the stroke. Sweep guards should not be used on large presses.

**Pull-back guards** forcibly remove the hands of the operator from the point of operation if he is out of rhythm with the machine. Cables connect the ram with wristlets on the operator's arms. As the ram descends, the hands are forcibly withdrawn. The guard must be adjusted to each operator and each job because of the variations in individual arms, hands and fingers.

**Die design.** On punch and forming presses it is frequently necessary to install guards of a different type for each set of dies used. For this reason, enclosure guards should always be considered integral parts of the dies.

**Feeding tools.** Several types of feeding tools have been developed for use on presses with automatic feeds or enclosed guards. These tools are made of soft metal, aluminum or magnesium. They include pushers,

## Section 8—Machine Operation and Guarding

pickers, pliers, tweezers, forks, and suction disks.

These tools are not substitutes for guards and should be used only in conjunction with two-hand trips or pull-back guards.

**Hood enclosure** and cover guards are used on woodworking machines and many other types of equipment. Frequently, such guards are automatic in action. Others are of rigid construction.

**Nip hazards**, such as rubber mills, calender rolls, dough breaks, and others, can be protected by sensitively adjusted controls that operate dynamic brakes when contacted by any part of the operator's body. These guards stop the machine in the shortest possible time.

**Two-hand controls** are frequently installed on power presses, bakery machinery, guillotine paper cutters, and other types of equipment where barrier guards are not practicable.

**Interlocking devices** prevent operation of the starting control when the cover or barricade is not in place. These are used on centrifugal extractors, dough mixers, tumblers, and some types of pressure vessels.

**Photoelectric guards.** The photoelectric relay consists of a beam of light. When this is broken by the press operator's hands, the start or completion of the ram stroke is prevented. The photoelectric relay responds instantaneously, is completely automatic, takes up little space, is easily installed and economical to maintain. Against these advantages are comparatively high installation cost and limited uses.

On presses with friction clutches, the ram travel stops immediately when the light beam is broken. This method is not effective on presses with positive clutches because the ram will continue its stroke until the end of its cycle. The guard should be operated from a closed electric circuit so that current interruption will automatically prevent the press from tripping.

**Radioactive guards** have been used on some power press operations. The operator wears radioactive wrist bands. When his hands are in the protected area, the radioactive units are detected by Geiger tubes, and the press will not operate. Radioactive materials are within safe limits.

### Power Transmission

Power transmission apparatus includes shafting, belting, pulleys,

gears, starting and stopping devices, and other moving parts of equipment used in the mechanical transmission of power. Also included are prime movers, intermediate equipment, and other machines.

Power transmission parts, particularly in modern installations, contribute a relatively small proportion of the total number of injuries. Nevertheless they can cause permanent disabling injuries and should not be neglected.

Individual motor drives and modern designs with moving parts enclosed have eliminated much guarding on the job. However, some guards must still be added when machines are installed.

### Materials for Guards

Sheet metal, perforated metal, expanded metal, heavy wire mesh or bar stock may be used for most types of guards.

**Transparent plastic** is used where inspection of moving parts is necessary and the strength of metal is not needed.

**Shatter-proof glass** is used in similar situations, particularly where illumination of guarded parts is essential and the flexibility of plastic is not required.

Where flying particles may mar safety glass or plastic the surface may be protected by replaceable glass covers.

**Wooden guards** are relatively low in strength but are sometimes used where splashes and fumes from corrosive substances would attack iron or steel.



Many types of protection have been devised for the protection of punch press operators but the enclosure guard remains the most generally useful. This one was built in the shop, with simple tools and a do-it-yourself kit of materials. (Harrington and King Perforating Company)

**Aluminum** or other soft metals may be used where resistance to rust is essential, or there is possibility of damage to the machinery from iron or steel.

**Supervision.** Frequent checks should be made to see that instructions are observed and that safety devices are functioning.

Operators occasionally make safety devices ineffective in an attempt to speed up production or make operation easier. This is especially frequent with two-hand controls. Operators should be warned of the hazards involved and instructed in the use of safety devices.

### Circular Saw

The circular saw is one of the most useful of woodworking power tools, and it is also the most dangerous. It causes more permanent disabilities than any other machine in the industry.

Rim speed of a circular saw should not exceed 12,000 fpm, unless the saw has been manufactured or hammered for a higher speed and is so marked. When turning at high speed the teeth are almost invisible.

Following are important points in guarding:

1. Saw must be equipped with a hood that will cover it to at least the depth of the teeth.
2. Hood must automatically adjust itself to thickness of material being cut and remain in contact with it, unless hood is in a fixed position. Then space between bottom of guard and material must be no more than half an inch.
3. Exposed parts of saw blade under table must be guarded.
4. There should be a clear view of saw at point of operation.
5. Guards should be designed and constructed to avoid vibration.
6. All teeth should be even in length.
7. Blade should not be lumpy or warped.
8. Depth, size and shape of gullets should be such as to let all sawdust discharge freely. Bottom of the gullet should be round.
9. Cut in wood should be a trifle wider than thickness of saw blade.
10. Saw must be discarded if it has a crack longer than 5 per cent of diameter, unless diameter is reduced to eliminate crack and tension is corrected.

### Swing Cut-Off Saws

1. Swing cut-off saws must have device to return saw automatically to back of table when released at

—To page 222



# Here's modern press control at its SAFEST



Yes, with the Schrader Two-Hand Press Control you'll find operator confidence soars—and so does production—because this easy-to-install unit can be operated only by both hands simultaneously. This means:

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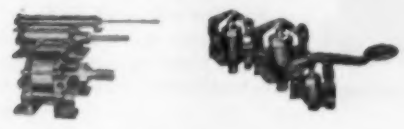
**2** Production stays high, because the effortless fingertip operation with Schrader Controls leaves operators fresh and alert, even after a full day's work.

Look over the mechanical-clutch machines in your shop. Wherever you find operators straining back and leg muscles to maintain production—tiring themselves so that they are less alert to safety precautions—there's a real need for *Schrader Pneumatic Controls*. Available for easy foot operation as well as two-hand operation as shown here, Schrader Control Sets come complete and ready for mounting on your presses.

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.....

## Section 8—Machine Operation and Guarding

# Electric Equipment

**ELECTRICITY** for power and light has contributed much to modern industry in efficiency, cleanliness and safety.

The flexibility of electric power permits installation of motors on individual machines, or for driving groups of machines. This makes it possible to dispense with shafting, belts and other transmission equipment which require extensive guarding and interfere with light, ventilation and housekeeping.

Installation, maintenance and use of electric equipment have introduced new hazards but these are well known and effective control measures can be applied.

Rules for use of electric equipment are given in numerous publications, including the *National Electrical Safety Code*, which deals with prevention of injuries, and the *National Electrical Code*, which deals with fire protection.

Electrical equipment which bears the approval label of recognized testing laboratories has passed exacting tests and can be used with confidence.

**Installation.** All electrical work should comply with applicable codes.

Transformers, control boards, starting rheostats, and other apparatus should be placed where there is the least danger of accidental contact with energized conductors.

All exposed current-carrying parts should be further protected by enclosures, railings or special guards.

Motors should be mounted so as not to interfere with normal plant traffic. Non-enclosed type motors should be located in areas relatively free from dust, moisture, or corrosive vapors.

**Isolating equipment.** Transformers, control boards and other accessories should be placed in special rooms to which only authorized persons have access.

If a separate room is not feasible, enclosures should be built around equipment having exposed conductors. Enclosures made of metal should be effectively grounded.

Barriers may be used to prevent accidental contact with electrical equipment. Frames may be made of wood, rolled metal shapes, angle iron or pipe. Filler may be of woodstrips, sheet metal, perforated metal, expanded metal, wire mesh, or shatter-proof transparent material.

Some protection can be obtained by elevating wires and current-carrying parts at least eight feet above any working level to which employees (other than qualified electricians) have access.

Where long metal parts, such as rods, bars and pipes are handled, partial enclosures or barriers should

be provided to prevent contact with overhead electrical installations.

**Warning signs** should be displayed near exposed current-carrying parts, especially high-voltage installations.

Many standard machine-guarding practices apply to electric equipment, but there are certain hazards peculiar to electricity. Particular attention should be given to the *National Electrical Safety Code* and the *National Electrical Code*.

**Protective grounding** is necessary for exposed non-current-carrying metal parts if the equipment is supplied by means of metal-clad wiring, when installed in a wet location, and when it operates with any terminal at more than 150 volts to ground. Parts to be grounded include motor frames, cranes, cases of transformers and oil switches, wiring conduit, and metal lamp sockets.

Frames of all portable motors which operate at more than 50 volts to ground should be grounded.

**Motors** should be of the type and size required for the load and for conditions under which they must operate. Overloading over long periods, use of non-approved motors in areas containing flammable vapors or dusts, and defective wiring should be avoided.

Motor windings should be protected from metal particles, dirt, dust, lint or other material which may damage the windings or become ignited.

In areas containing flammable dust and gases, motors designed for hazardous locations should be installed. The *National Electrical Code* should be followed.

Grounded metal enclosures are recommended for starting rheostats, switches, fuse panels, and other operating accessories. In some devices, both switch and fuses are enclosed in a cabinet so arranged that the switch can be operated without opening the cabinet. The switch is interlocked through a cam so that the fuses are inaccessible until the switch is opened.

Another type of enclosed switch permits the door of the cabinet to be opened with a key, even though the switch is closed. With either type of cabinet, it is possible to padlock the door open or closed, and the switch can be padlocked in the open position.

**Maintenance and repair work.** When repair work is being done on motors, their controlling devices, or the machinery they drive, the cir-

—To page 223



Push-button control in a steel mill, avoiding the hazard and drudgery of the conventional manual lever in making the pour. (Blaw-Knox Co.)

## MICRO SWITCH Trip Control

A PRINCIPLE OF GOOD PRODUCTION



This operator can't get hurt. She needs *both hands* to operate this air press. Easy, finger-tip actuation reduces fatigue.

Open view of inside of control box. Unless all switches in the system are actuated together the operating circuit is broken. The control remains inoperable until intentionally reset.

## Here's a way to increase power press production up to 25%

• These three advantages of MICRO SWITCH Trip Controls mean increased production for your power machines:

- 1. Instantaneous electrical response.** Increases number of operations in a given period.
- 2. Universal applications.** (a) single stroke or repeat operation. (b) two hand or multiple station control. (c) automatic up-stroke or inch control for hydraulic, pneumatic or mechanical friction clutch presses.

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MICRO SWITCH Trip Controls can usually be used without additional equipment on machines equipped with solenoid or air cylinder clutch actuators. MICRO SWITCH provides complete package when other clutch actuating equipment is required.

Write for catalog and name of distributor nearest you.

# MICRO SWITCH

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY  
FREEPORT, ILLINOIS



# HAND AND POWER TOOLS

**HAND TOOLS** of many types are used in even the smallest shops. Since their use involves accidental contact with cutting edges or severe blows, they are responsible for numerous injuries on the job.

Estimates of the percentage of disabling injuries caused by hand tools range from 5 to 15. While many of the injuries involve only first-aid treatment, these slow down work and offer chances for infection.

Hazards are increased by selection of the wrong tools for the job, neglect of maintenance, and the idea that anybody can use them.

Portable power tools have increased the hazards of hand tools by high speed operation and more severe blows. With electric tools there is also the hazard of shock.

## Types of Tools

Tools commonly used in industry are of the following general types:

**1. Metal Cutting**—Cold chisels, marking tools, bull chisels, hack saws, tin snips, cutters.

**2. Wood Cutting**—Chisels, gouges, saws, axes, adzes, hatchets, knives, brad awls.

**3. Lifting**—Levers, crowbars, jacks, hooks, shovels.

**4. Torsion**—Wrenches of various types, pipe tongs, screwdrivers, pliers.

**5. Striking**—Hammers, sledges, mauls, picks, punches.

Some tools belong in more than one classification. An ax, for example, is both a cutting and a striking tool.



The tool room has the responsibility of issuing safe tools. Those not in good condition should be replaced or repaired.

**Accident causes.** One or more of four primary causes are responsible for injuries with hand tools. Following are examples:

1. A wrong or improvised tool—a file or screwdriver for prying; a wrench for hammering.

2. A defective tool—a burred chisel head; a dull saw or knife; a split maul handle; a tool of poor quality.

3. Tools incorrectly used—striking two hard-surface tools together; failing to take practice swing with sledge to adjust for clearance; pulling on pliers in line with face.

4. Tools not put away—wood chisel loosely laid in tool box; hammer left on edge of machine; knife left on table.

**Selection.** Tools for both routine and special work should be kept in stock or readily available. High grade tools are the best buy and the difference in initial cost is offset by longer life, reduced upkeep and lessened risk of accident.

Suitable arrangements should be made and responsibility placed for the purchase, handling and care of tools. The purchasing department should be kept informed of tool performance as a guide to future purchases.

Alloy steels combine strength and toughness with light weight which justifies the higher cost for some jobs. Alloys are used for hammers, wrenches, screwdrivers, wood working tools, pliers, rivet sets, saws, knives and punches.

Some alloys offer resistance to mushrooming, and chipping but no tool should be subjected to unnecessarily rough use.

Non-ferrous hammers or mallets should be used for striking tempered or case-hardened tools. These hammers are usually made of copper, lead, bronze, brass, rawhide, or wood.

**Handles.** With hammers, sledges, axes, picks, etc., the greatest strain is where wood and metal join. An adequate supply of good handles should be kept in the toolroom. These should be straight-grained wood, free from slivers. Hickory, ash and maple are preferred. Handles should be fitted by an experienced person.

**Insulated tools.** For working around electric equipment, tools with insulated handles are frequent-

ly used. These provide desirable protection but are not a substitute for rubber gloves and other protective devices.

**Marking tools.** Steel stamps and holders for stamping identification marks on machine parts and other metal surfaces are available in alloys which resist mushrooming and do not chip readily.

**Car movers.** For moving cars on rails, car movers which do not slip readily are available. When two men are needed to move a car, two car movers should be used. Ordinary crow bars should not be used.

## The Tool Room

Centralized tool control facilitates uniform inspection and maintenance of tools. Special equipment, such as exhausted grinders and welding equipment permit uniformly good maintenance. Protective equipment, such as goggles, can be recommended and issued with the tools.

Centralized controls also makes it possible to keep records on tool failure and locate unsafe conditions and unsafe acts. Tools are exposed to less damage than with scattered storage.

A procedure can be set up so that the attendant can send tools in need of repair to a department equipped for reconditioning.

Some companies issue to each employee a set of numbered checks at the time of employment. These are exchanged for tools at the supply room. By this system the attendant knows where each tool is and can call it in for inspection at regular intervals.

When there are operations at several locations it is not always practicable to maintain a tool supply room. In such cases the foreman

—To page 220




Hammers with plastic heads are non-sparking and are used where steel might damage the material being processed.



# Bailey EQUIPMENT


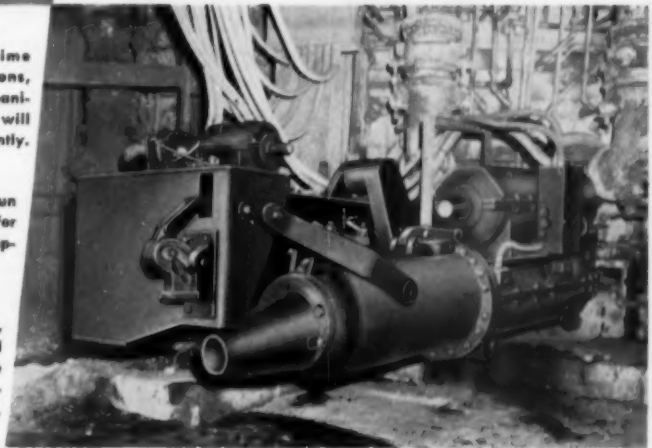
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Regardless of time between operations, this Bailey Mechanical Goggle Valve will open or close instantly.

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## Hand and Power Tools

—From page 218

should inspect all tools frequently and take out of service those found defective. A check list is helpful.

Some workmen use their own tools rather than those furnished by the company. Privately owned tools should be subject to the same inspection as those owned by the company.

### Carrying Tools

Tools should never be carried where they interfere with using both hands while climbing. A strong bag, bucket, or other container should be used for hoisting or lowering tools.

Chisels, screw drivers and pointed tools should never be carried edge or point up in the pocket. They should be carried in a tool box or cart, in a carrying belt like those used by electricians and steel workers, in pocket tool pouch or in the hand with points and cutting edges away from the body.

Display boards used for maintenance and repair tools do much to encourage return of equipment.

Racks or bins which can be moved to the work area are also useful.

An individual workman's tools should be kept in a box or rack convenient to his work area. The box should have designated places for such things as wire brushes, chisels, saws and knives to avoid exposing sharp edges.

**Inspection.** Permissible wear limits for tools should be set up as a guide for inspection when they are returned to the crib. Lacking such standards, the attendant or inspector should be qualified to pass on the condition of the tool.

Periodic inspections of all tool operations are needed to insure efficient control. Inspections should include housekeeping in the tool crib, tool service, number of tools in the inventory, handling procedure, and condition of tools in general.

**Maintenance and repair** require adequate facilities, such as work benches, vises, forge or furnace for hardening and tempering, tempering baths, repair tools, grinders, goggles and adequate lighting. Repairs should be done by trained men.

An adequate supply of repair parts should be kept on hand.

### Non-Sparking Tools

Where hand tools may strike a spark and ignite flammable dust,

gas or vapor, non-ferrous tools are widely used. These tools are made of such metals as aluminum, bronze, brass and beryllium-copper.

Tools made of these alloys include hammers, chisels, punches, prybars, screw drivers, scrapers, spatulas, picks and shovels. Special tools of any type can be made to order.

Substances easily ignited include gunpowder, lint, TNT, carbon disulfide and ethyl ether.

Being softer than steel, non-ferrous tools are less likely to break off fragments from the metal being worked on by the tool.

With continued use, these tools may become impregnated with particles of foreign substances which may cause sparks if not removed.

Non-ferrous alloys are more expensive than steel and these special tools are used only where there is an explosion hazard.

#### Portable Electric Tools

General classifications of hand-operated power-driven tools are:

1. Abrasive tools, such as disk and portable belt sanders, polishers, and bench and flexible shaft grinders.
2. Drills.
3. Saws and other cut-off tools, routers, etc.
4. Assembly tools, such as screw drivers, nut runners and tappers.
5. Hammers.
6. Sheet metal shears.
7. Fans

Portable electric tools are generally designated as:

**Light duty**, for intermittent use on light work.

**Special duty or standard duty**, for slightly heavy work or fairly continuous operation.

**Heavy duty**, for continuous operation and production service or for heavy work.

Safety switches, which operate the motor only while the switch is held—Turn page

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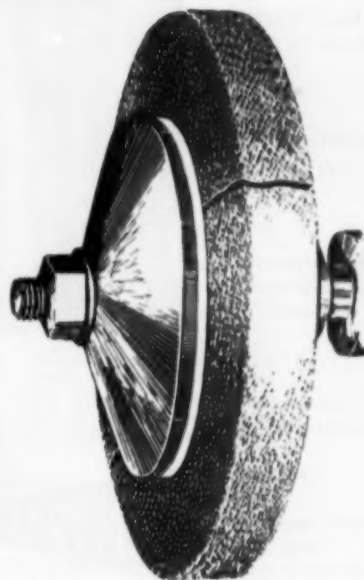
Check It to Check Your Accidents—George MacDonald, Feb. 1953.

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A whirling grinding wheel can tell its own story of havoc when it explodes . . . But in this case Perks Safety Washers do the telling!

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Standard Safety does *not* recommend to you the use of broken grinding wheels—even with Perks—but Standard Safety does recommend Perks Safety Washers as a precaution against possible tragedy in your company. Perks Safety Washers are easily installed on any size grinding wheels. Keep your equipment and personnel safe-guarded. Write now for Bulletin No. 54 containing complete information about Perks Safety Washers.

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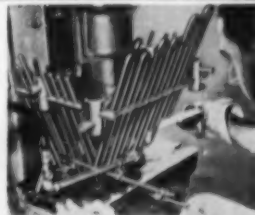
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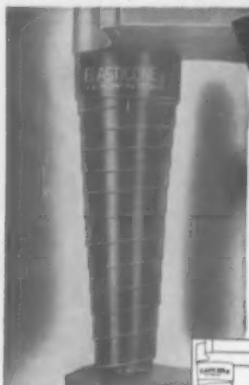
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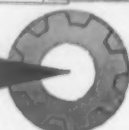
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**No Tools Required**

**No Installation Costs**

Elasticones are manufactured in stock sizes. Specify O.D. of bushing and full open height of set when ordering. Write for full information and literature.

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## CENTRAL SAFETY EQUIPMENT COMPANY

in the closed position by the operator, should be used.

Three possible methods of preventing electric shock to the operator are: (1) Prevent electric contact with the shell; (2) Use non-conductive material for the shell and all parts which the operator may handle; (3) Ground the shell by means of a third wire or central grounding.

Grounding is generally considered the most practical method of safeguarding the operator against shock.

## Circular Saws

—From page 214

any point. Fiber rope or cord must not be used in device.

2. Limit chains, positive stops or table extensions must be provided to prevent saw from swinging beyond front edge of table.

3. Where it is possible to pass behind a swing cut-out saw, rear of saw must be completely housed when saw is in back position. Housing must include swing frame as well as saw.

## Manual-Feed Ripsaw

1. A splitter or spreader must be provided to prevent pinching or binding. It must be slightly thinner than the saw kerf and slightly thicker than the saw disc.

2. Anti-kickback devices of steel should be designed and installed so as to be effective for material of all thicknesses.

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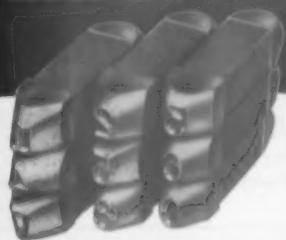
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**SAFETY**  
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1053 CHATEAU STREET, PITTSBURGH 33, PA.



## Electricity

—From page 216

cuit should be de-energized by opening the necessary switches and locking them in the open position.

If a switch cannot be locked open, it should be blocked and a tag attached showing that the switch is to be closed only by the man whose name appears on the tag. Warning signs should be displayed.

Wiring depends upon type of building construction, size and distribution of electrical load, exposure to dampness or corrosive vapors, location of equipment, and other factors. For most plant conditions, rigid metal conduit, effectively grounded, is most satisfactory.

Other methods which may be used under certain circumstances include armored cable, non-metallic sheathed cable, flexible metal conduit (BX), raceways, and open wiring on insulators. National and local wiring codes should be followed.

## Cords, Sockets, Lamps

Extension cords should be of a type listed by Underwriters' Laboratories and labeled to show compliance with all requirements of the *National Electrical Code*. They should be inspected regularly. Kinking or excessive bending of cords should be avoided.

Ordinary lamp cord should not be used where it will be exposed to mechanical wear or to moisture—never for extension lamps in boilers, tanks, or on damp or metal floors.

Cord for portable tools and equipment is made in several grades. Rubber-sheathed cord should be used with tools and lamps in boilers, tanks and other grounded enclosures.

For heating devices, such as electric irons and water heaters, the cord has an insulating covering containing flame-proofing material such as asbestos fiber. It resists high temperature but not dampness.

Sockets should be of porcelain, non-conducting plastic, or rubber covered. Ungrounded metal-shell sockets are not recommended.

Extension lamps are sometimes used under conditions where a shock of 110 volts might be fatal. Safe cords and lamp holders must be provided and maintained in good condition. Handles should be of non-conducting material and there should be no metallic connection between the lamp guard and the socket shell.

—Turn page

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*Standardized Parts*



Write for your copy of this valuable bulletin

This bulletin illustrates a simple and inexpensive way of constructing your own guards for moving parts, such as: flywheels, gears, and belts, and for individual punch press dies. Only ordinary tools, such as a hack saw, hand snip, hammer and screw driver are needed. When properly constructed, guards made of sturdy H & K parts will comply with State and Insurance requirements and will conform with American Standard Safety Codes.

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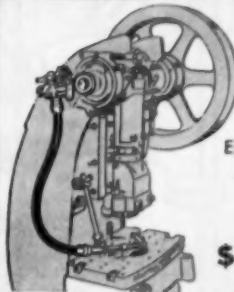
NEWEST LITTELL UNIT Wins Immediate Approval

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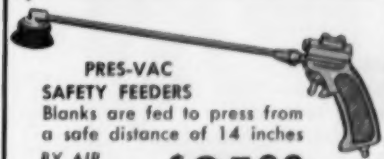
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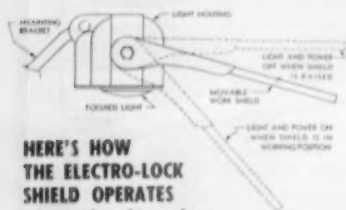


## JUNKIN ELECTRO-LOCK SHIELD



### The Shield Which Commands Operator Safety

The position of the Junkin Electro-Lock Shield is controlled by mercury switches. Interlocking power and light circuits will not permit the machine to operate unless the shatter-proof shield is in a completely protective position. Affords perfect visibility, and protects the operator from flying particles. Write for free bulletin No. 103.



**HERE'S HOW  
THE ELECTRO-LOCK  
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—permits clear view  
of work, still providing  
maximum protection

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SAFETY APPLIANCE CO.  
101 S. FLOYD ST.  
LOUISVILLE 2, KENTUCKY

## Electricity

—From page 223

**Miniature voltage.** Portable transformers which step the lamp voltage down to 6 volts are frequently used where the shock hazard is serious.

**Employee training.** The safety program should include thorough training of all employees who install or operate electrical equipment. In addition to instruction in the hazards of electricity they should be trained in up-to-date first aid techniques.

Of particular importance is the knowledge of the arm-lift, back-pressure method of resuscitation. Distribution employees should also know the pole-top method.

### Over-Current Devices

Fuses or circuit breakers should be installed in every circuit for protection of both personnel and equipment. These devices open the circuit automatically in the event of excessive current flow due to accidental ground, short circuit, or overload.

Types of fuses include:

A **link fuse** is a strip of fusible metal between two terminals of a

fuse block. If exposed, it may scatter hot metal when it blows.

**Explosion fuses** are used in central stations, power houses or on overhead lines. When they blow, the gases generated aid in quenching the arc.

**Plug fuses** are used on circuits which do not exceed 30 amperes at not more than 150 volts to ground. The type which cannot be bridged inside the holder is recommended.

**Cartridge fuses** have fusible metal strips enclosed in fiber tubes. Those which indicate when the fuse is blown and the refillable types in which fusible elements may be replaced are available.

**Insulated fuse pullers** should be kept on hand for pulling and replacing fuses. It is a code requirement that fuses be protected by a switch which will deenergize the fuses when opened. If the fuse is not protected by a switch, the supply end of the fuse should be pulled out first, and in replacing, the supply end should be inserted last.

**Circuit-breakers** are used in high voltages or large current capacity



circuits, and are becoming more common in many kinds of circuits. They may be instantaneous in operation, equipped with timing devices, manually or power operated.

### Switches

Types of switches in use include snap switches, knife switches, enclosed externally operable air-break switches, and oil switches. Those designed for controlling individual motors and machine tools and for lighting and power circuits are of the enclosed type.

Open-knife switches are undesirable because of exposure of live parts and because of the arc formed when the switch is open. It is advisable, therefore, to enclose knife switches in grounded metal cabinets having a control level extending through a slot in the cover.

Oil switches have contacts which operate while submerged in oil. They are especially desirable in circuits of 750 volts or more and may be used also in lower voltage circuits.

Snap switches, such as pushbutton or toggle types, usually have live parts enclosed. Flush switches should be installed in metal boxes, and surface switches used in open wiring and moulding work should be mounted on porcelain or plastic sub-bases. These switches should indicate whether the circuit is open or closed.

Snap switches are preferable to key or pull-chain sockets. Key sockets, if used, should be of porcelain.

—Turn page

### REFERENCES Electricity

National Safety Council  
Accident Prevention Manual for Industrial Operations.

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Electricity and the Human Body—W. B. Kowenhoven, Feb. 1951.

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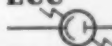
National Safety News, March, 1955

## ELECTRONIC EYE

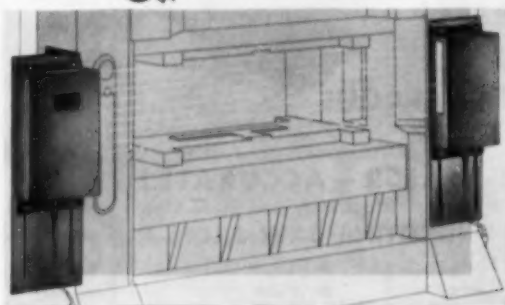
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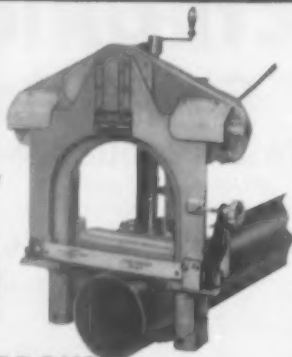
Shows many typical set-ups, and use on radial drills. Complete specifications on all models. Covers MONEY BACK GUARANTEE and 30 DAY FREE TRIAL OFFER.



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When maintenance men are working on machines, each should put his own padlock on the machine, making it impossible for the power to be turned on until all have finished. (Master Lock Company)

plastic, or other non-conductive material. Pull-chains should contain non-conductive links.

Protection against accidental shock from live electric parts, such as switchboards, fuse panels and control equipment is obtained by insulating the floor area within reach of live parts.

For low-voltage exposure, dry wood floors without metal parts, or insulating mats, may be used. Mats should be non-conductive and moisture resistant.

**Applications of  
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1. Protection of machine operators:  
Guards for hydraulic presses, press brakes and similar machinery.
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Flame failure detection on oil and similar fuel-burning plants.  
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Protection against high-voltage test equipment.  
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Height gauge for loaded vehicles.  
Burglary protection.
- G. A. G. Iye in *British Journal of Industrial Safety*, Vol. 3, No. 29 (1954)



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Get more efficiency from your employees—and stop risking accidents by using Ideal Reel Tie Wire Dispensers . . .

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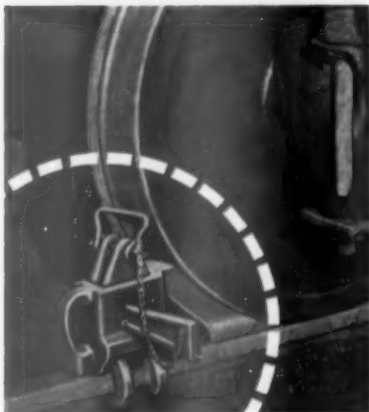


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Yes... the M & M Rail Clamp reduces all those dangers when you use it to hold car wheels in position because it positively will not slip.

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## Cold Weather Precautions (Factory Mutual Laboratories)

**Wet Sprinkler Systems.** Provide adequate heat in all sections, especially over long week-ends.

Repair windows and doors which are not weather-tight.

**Fire Pumps.** Keep pump houses adequately heated.

Protect suction pipe and intake from freezing.

**Extinguishers.** In unheated locations, provide non-freezing extinguishers, heated cabinets for extinguishers which could freeze, or fire pails filled with non-freezing solutions.

**Hydrants.** See that hydrants are tight and drain properly.

Keep hydrants and indicator posts unobstructed by snow.

**Dry Sprinkler Systems.** Make sure dry-pipe valve enclosures are well heated.

Check air pressures daily.

Check dry-pipe alarms.

Blow out drains and low points frequently.

Check the pitch of all piping for pockets where moisture could collect and freeze.

**Sprinkler Tanks.** Make sure heating systems are in good operating condition. Flush out the circulating pipes and heater.

Provide heating systems for tanks not so equipped. Do not overflow tanks to prevent freezing.

## HAZARD SPOT CARD

For Job Planning and Instruction

### WORK AREA

- Footings: uneven ☐ obstructed ☐ slippery ☐
- Cramped quarters ☐
- Exposure to traffic ☐
- Insecure piles or overhead material ☐
- Inadequate illumination ☐ glare ☐
- Temperature: too hot ☐ too cold ☐
- Exposure to gases ☐ dust ☐ fumes ☐
- Hazards from nearby operations ☐

### MACHINERY

- Point of operation: cutting ☐ shearing ☐
- punching ☐ abrading ☐ flying material ☐
- Power transmission: shafts ☐ belts ☐
- gears ☐ pulleys ☐ electrical conductors ☐
- Unsafe starting and stopping mechanisms ☐

### TOOLS

- Wrong tool for the job ☐
- Tool in unsafe condition ☐
- Tool placed in unsafe position ☐

### HANDLING MATERIAL

- Material or objects: heavy ☐ unwieldy ☐
- rough ☐ sharp ☐ hot ☐ corrosive ☐
- Unsafe handling equipment: trucks ☐
- conveyors ☐ hoists ☐ containers ☐

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## MERRILL MATERIALS HANDLING DEVICES

4  
SIZES



LIFTING CLAMP



TWIN LIFTER



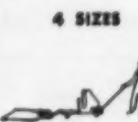
HAND GRIP



DRUM FILTER



DRAG CLAMP



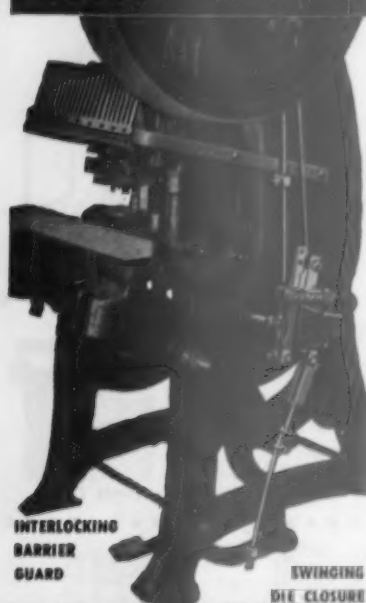
DRUM OPENER



3-34-1

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JUNKIN safety guards prevent press accidents, afford maximum protection, increase press production, lower insurance costs and generally improve plant morale. Make an investment in safety now and investigate Junkin Safety Guards for primary and secondary punch press operations. Write for free catalog "The Key to Protection".



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## LUBRICATION

**LUBRICATION** is an important part of a preventive maintenance program and should be handled on a definite schedule.

Modern machines operate at high speeds on countless bearings which need lubrication at frequent intervals. New lubricants and lubricating systems have been developed to meet these needs.

Lack of lubrication results in hot bearings, shutdowns, and sometimes fires.

Over-oiling of motor bearings causes oil to drop or to be thrown onto the insulation of electrical winding. Oil deteriorates the insulation, exposing the live conductors that will arc and cause fires or electrically charge ungrounded surfaces. Oil on the floor creates slipping and fire hazards.

A survey of the plant will determine lubrication requirements. This information should be entered on the machinery records. Machinery should then be checked for missing fittings and oil cups and in plugged oil holes.

This is a good time to make improvements in the lubrication systems. The following methods are commonly used.

1. Capillary oilers
2. Wick oilers
3. Ring and chain oilers
4. Gravity feed oilers
5. Pump feed oilers
6. Cartridge oilers

Some machines have hundreds of remote bearings and these can be served efficiently and economically by centralized systems. Clean oil or grease is supplied under pressure from the central pumping unit to every bearing.

The lubricant is renewed as often as the machine and operation require. This may be once or twice each shift or several times an hour.

On some systems an indicator signals the delivery of the correct amount of oil to each bearing.

With a central pressure system there is no need to stop the machine for lubrication and the hazardous job of crawling over the machines is eliminated.

Pressure lubrication systems require the use of special greases. Silicone grease, one of the newer lubricants, has shown unusual ability to stand up under high speeds and high temperatures.

### For Older Installations

Addition of an automatic system may not be practical on some older machines. Other measures will help to improve lubrication and reduce the hazard to the oiler. One or more of these methods may be used for reaching remote bearings:

1. A service platform or runway giving access to several bearings. Moving parts of machinery should not project over platforms; if this is unavoidable, these parts should be enclosed.
2. A small car suspended from an overhead I-beam enables the oiler to travel parallel to the line shaft, and reach bearings with his oil can or grease gun.
3. Long-spout gravity flow or force-feed oil cans enable the oiler to stand in the clear. Some of these have spouts long enough to reach overhead line shaft bearings from the floor.
4. Oil reservoirs at individual bearings with control devices operated by hand poles.
5. Extension pipes on bearings where grease or oil cups are in the danger zone. These may not be practical in cold places where low temperatures make it difficult to force oil or grease through the pipes.



Conveyors carry people as well as materials. This moving rubber ramp was installed in the Sam Houston Coliseum, Houston, Tex., and first used for Houston's 23rd Annual Fat Stock Show. (Link-Belt Co.)

# SAFETY PLUS!



**SAVE** fingers, eyes and dies!  
Get Osborn Safety Pliers . . . made of Osmolloy, the sturdy, long lived aluminum alloy that will flatten under impact, leaving dies unhurt. Thousands now in use. Write for literature!

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MADE OF THE TOUGHEST  
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**WILL NOT**  
DAMAGE VALVES  
MAKE SPARKS  
MAKE BURRS  
SLIP OFF



*Developed by the men  
who use them daily!*

The Bergman SAFTY-SPANNER CO.  
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## Safe Storage

Fires in storage areas are responsible for a high percentage of the total loss in fires in industrial plants. While fires do not occur as frequently as in manufacturing areas the damage per fire is often higher.

Suggestions for safe storage include:

1. Keep storage out of manufacturing areas.
2. Keep storage from below manufacturing processes unless the building is non-combustible and floors are watertight.
3. Storage rooms need sprinklers if either contents or building will burn.
4. Store valuable materials in sprinklered building.
5. Don't overlook fire protection just because shed values are small.
6. Keep sources of ignition out of storehouses.
7. Keep materials in low, well separated piles.

Waterproof floors with adequate drainage should be provided if lower stories contain stock or machinery susceptible to water damage. Tarpaulins should be kept on hand to prevent water damage.

Fire-resisting vaults should be provided for business records and valuable drawings. Civil defense measures suggest storing vital records at some point remote from industrial centers.

When construction work is in progress, good housekeeping should be practiced and temporary fire protection provided. Salamanders and welding and cutting must be watched.

Automatic detection and sprinkler systems are recommended for combustible construction or occupancy.



"Oh, the arm happened on the job and my co-workers did the rest. . . Seems I ruined a long-standing no-accident record."

## MAKE YOUR FANS SAFER!

Protect Workers From Injury



This fan guard prevents hand, arm and head injuries. Made of a mesh fabric, it is washable, mildewproof and won't interfere with the normal flow of air and is non-static.

Cover protects back and sides of fan as well as the front.

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Wiesman cam-action press guards enable operators to work at top speed without fear of accident. Guarding is effective and completely automatic . . . does not hamper operator's vision or movement. For all sizes and styles of presses. Used by hundreds of firms. Inexpensive . . . easy to install.

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# PLANT PROTECTION

EACH YEAR the United States is devastated by fires which destroy nearly a billion dollars worth of property and take more than 10,000 lives. Business and industrial fires account for more than half of the toll.

Industrial fire prevention has been defined as the business of staying in business. Every day some 97 factories are hit by fire. Of the plants that are destroyed by fire 40 per cent go out of business. This loss is not borne by the companies alone; it is shared by the employees whose jobs are burned up and by the communities which feel the loss of the payroll.

Sound fire prevention engineering is the basis of effective programs. That means fire-resistive construction, segregation of hazardous processes, limitation of fire areas, and protection of openings between floors.

Advance planning is all important. Through careful preparation the plant has the right equipment and trained men on hand in case fire should strike. Otherwise, fire could bring panic and confusion instead of a methodical defense.

Fires often seem to strike suddenly and mysteriously—or so it seems in the first reports in the newspapers. But investigation invariably shows up weak spots in the company's fire defense—and there is usually a combination of circumstances.





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Detection and Alarms . . . . .	238
Plant Organization . . . . .	240

9



Rockwood Nozzle SG-60 is of lightweight, durable, aluminum alloy with high-polished finish. Chrome plated bronze ball valve with synthetic rubber seat. All gaskets are synthetic rubber, all other parts are bronze, brass or stainless steel.

## One nozzle fights fire 5 ways

This is the WaterFOG nozzle you can use to fight fire in 5 different ways.

It's Rockwood's "ALL-PURPOSE" SG-60 that makes unnecessary most special purpose nozzles. It discharges fire quenching High Velocity WaterFOG, Low Velocity WaterFOG (with applicator), FogFOAM or a solid

stream of water or FOAM.

This Nozzle is designed to put out Class A, B or C fires faster, safer and more economically. A quick shift of the handle instantly provides the right type of discharge for any type of firefighting job.

Put this efficient, versatile Rockwood SG-60 Nozzle to work for you.



### ROCKWOOD SPRINKLER COMPANY

*Engineers Water . . . to Cut Fire Losses*



High Velocity WaterFOG's solid cone pattern gives firefighter adequate protection from heat while quickly quenching blaze.



Low Velocity WaterFOG discharged with special attachment spreads umbrella pattern, smothering fire without causing turbulence to flammables.



FF extension discharging FogFOAM. Wide angle makes it possible to cover large areas at one time.



Shift to long range straight stream of water or FOAM can be made quickly and positively when required.

SEND FOR THIS INFORMATIVE BOOKLET

**ROCKWOOD SPRINKLER COMPANY**  
Portable Fire Protection Division  
323 Harlow Street  
Worcester 5, Mass.

Please send me your illustrated booklet No. 3-20-8 on type SG-60 WaterFOG Nozzle and other Rockwood firefighting equipment.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# FIRST-AID EXTINGUISHERS

**PORTABLE** extinguishers can be brought into action in the vital minutes before the company or city fire brigades can reach the blaze. Their prompt use by employees has prevented a vast amount of damage by both fire and water.

## Types and Uses

Common types of extinguishers are:

1. Soda-acid
2. Vaporizing liquid
3. Carbon dioxide
4. Foam
5. Dry chemical
6. Gas cartridge
7. Hand pump

Some extinguishers are available in both hand and wheel types. The wheel type is easily moved and has the extra extinguishing capacity needed for severe exposures.

### FOR CLASS A FIRES ONLY

These extinguishers should be used only on Class A fires in ordinary combustibles.

#### Soda Acid



This type of extinguisher is filled with a solution of bicarbonate of soda. A bottle in the top contains sulfuric acid. When the extinguisher is turned upside down, the chemicals mix, forming a gas which propels a stream of water.

Most soda-acid extinguishers have a capacity of 2½ gallons. They provide a stream of 30 to 40 feet, lasting about one minute.

#### Gas Cartridge

Looks much like a soda-acid extinguisher and operates the same way except that when inverted it must be bumped on the floor. This drives a pin into the cartridge, releasing the compressed gas which forces water through the hose. The extinguisher may contain either plain water or anti-freeze solution.



#### Pump Tank



Made in 2½ and 5-gallon sizes. Plain water or a non-freezing solution can be used. Hard pumping will force a stream 30 to 40 feet. It is difficult to use while being carried. It can be refilled by another person when the operator is using it.

### FOR CLASS A AND CLASS B FIRES

These extinguishers are suitable for use on Class A fires in ordinary combustibles and Class B fires in flammable liquids. They should not be used for fires in electrical equipment.

#### Foam Extinguisher

Shaped like the soda-acid and is operated the same way. In the outer part of the extinguisher is a solution of water, bicarbonate of soda and a foam making ingredient. Inner chamber contains water and aluminum sulphate.

When the extinguisher is turned upside down the chemicals mix and force out a foaming stream. The extinguisher contains 2½ gallons of liquid and generates eight times that amount of foam.

Foam extinguishers also come in 10-, 20- and 30-gallon wheeled units.



#### Loaded-Stream

Looks and operates like the gas cartridge type. Instead of water it contains a special solution of an alkali-metal salt.

### FOR CLASS B AND C FIRES

These are the only extinguishers which may be used safely on Class C fires (electrical equipment) as well as flammable liquid, or Class B, fires. They do not contain water.

#### Vaporizing Liquid



The one-quart size is one of the most familiar types. Carbon tetrachloride is the extinguishing agent. It is operated by pumping the handle. In contact with heat the liquid turns into a heavy vapor which blankets and smothers fires. In addition, vaporizing liquid works effectively on Class A fires. Range is about 20 feet and stream lasts 45 seconds.

Larger units of ½- to 3-gallon capacity are operated by stored gas or air pressure.

#### Carbon Dioxide



Discharges gas through a horn-like nozzle by operating a hand wheel, squeeze grip or trigger type mechanism. These extinguishers are available in a wide range of sizes, containing from 2 to 750 pounds of carbon dioxide. The larger units are mounted on wheels. The gas is non-corrosive and leaves no residue.

Successful operation requires a close approach to the fire.

#### Dry Chemical



Operates by squeezing a handle or turning a handwheel at the top, which punctures a cartridge of carbon dioxide in the neck of the extinguisher. This forces bicarbonate of soda out through the hose. The powder is treated to prevent caking.

The 15-, 20-, 25- and 30-pound sizes have a range of 10 to 12 feet. The 140- and 300 pound extinguishers can discharge a stream of 35 to 45 feet or a fan shaped stream of shorter range.

# FIRE-FIGHTING TECHNIQUES

**PREVENTION** of fire and reduction of fire and casualty losses depend upon application of four fundamental principles:

1. Fire prevention engineering
2. Early detection and extinguishment
3. Damage control—limiting damage due to fire and fire extinguishment
4. Prevention of personal injuries from fire or panic

**Causes.** The majority of fires in industry can be traced to four general causes:

1. Open flames, high temperatures  
—Stoves, furnaces, ovens, welding and cutting, lamps, dryers, heated pipes and surfaces, matches, smoking.
2. Friction  
—Hot bearings, belts, cutting, grinding, drilling.
3. Electricity  
—Defective wiring, arcs, sparks, heat resistance, static electricity.
4. Chemical reactions  
—Spontaneous ignition, use of reagents, acids, oxidizing agents.

## Extinguishing Methods

Many types of apparatus are available for various risks but all extinguishing methods are based on elimination of one of the three components of fire:

### TYPES OF FIRES

Fires have been classified by underwriters and manufacturers in three main groups.

**Class A.** Fires in ordinary combustible materials, such as wood, paper, textiles, and rubbish. They require quenching or cooling effects of water or solutions containing large proportions of water.

**Class B.** Fires in flammable liquids, such as gasoline, solvents, oil, grease, paint, varnish and lacquers, where blanketing or smothering effect is essential.

**Class C.** Fires in electric equipment, such as motors, generators, and switch panels. These require a non-conductive, extinguishing agent.

Fires in motor vehicles, aircraft and motorboats have the same problems of extinguishment as Class B but equipment must be portable. Extinguishing agents must be nonfreezing.

1. Eliminate oxygen from the air:  
—Replace air with inert gas.  
—Exclude air with a non-combustible cover.  
—Use a chemical which will dilute the oxygen in the air below the point required to support combustion.
2. Remove or shut off fuel supply  
—Shut off flow in liquid or gas supply lines.  
—Remove burning fuel.
3. Reduce temperature below ignition point.  
—Cool burning material with water or chemicals.

**Fire prevention engineering.** The services of a qualified fire prevention engineer will often be helpful in planning both prevention and protection.

First step is a survey of the plant—layout, manufacturing processes, materials handled, storage methods, and fire protection facilities.

With this information, plans can be made for improving structure and layout, installing additional equipment where needed, and training employees in prevention and extinguishment.

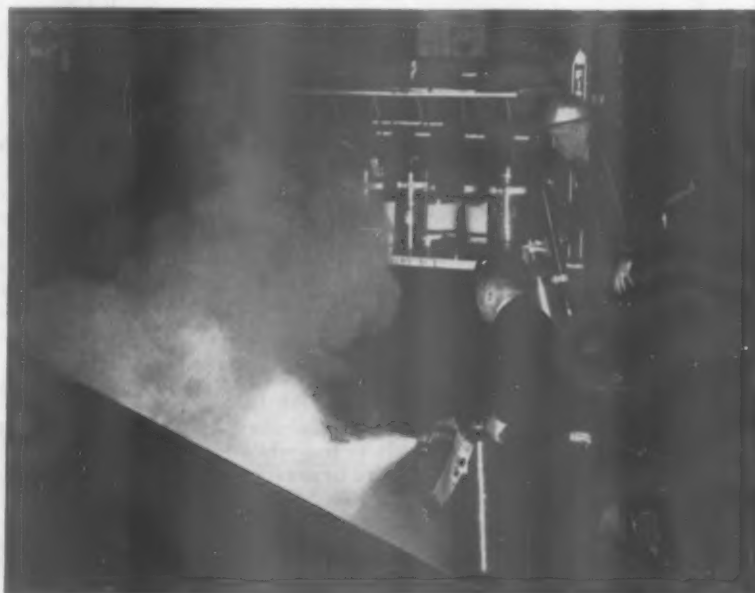
**Water Supply.** Water is the most widely used and effective extinguishing medium for most types of fires. Important exceptions are those with electrical equipment, flammable liquids, and in materials where water damage would be excessive.

In determining supply requirements, structural conditions and processes must be considered and the number of streams that might be required to cope with a blaze.

**Pumping equipment** should be able to supply enough streams at adequate pressure. Allowance should be made for pumps out of service for repairs and for continuity of pumping in event of power failure.

**Hydrants** should be located throughout the plant area so as to give adequate coverage of all buildings, and preferably not more than 50 feet from any building.

Systematic maintenance is essential. When hydrants are installed, attention should be given to drainage to minimize the danger of freezing in cold weather. Hydrants should be kept clear of snow and a thawing device provided.



Emergency wagon developed by employees of the locomotive shops of the Reading Railroad. Especially designed to fight fires that may occur in diesel shops, it carries equipment for all types of fires and for other emergencies. Here workers demonstrate procedure for fighting in a locomotive maintenance pit.



**Standpipe and hose** provide effective protection inside buildings when used by men trained in handling heavy streams. They are a valuable auxiliary to the city fire department. Piping should be of sufficient size for buildings of more than four stories.

**Couplings.** All outside hydrant nipples and hose couplings should be of the American Standard 2½-inch fire hose thread.

For outside use, 2½-inch single-jacketed rubber-lined hose is ordinarily used. It is flexible and light in weight. Double jacket hose is used principally for the rougher service in municipal fire departments.

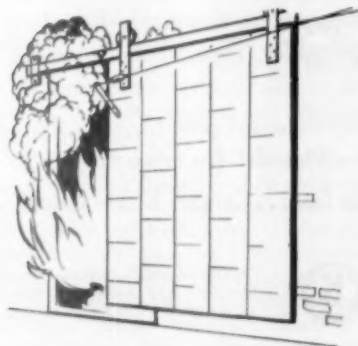
Rubber-covered hose is sometimes needed where there is exposure to fumes or corrosive liquids. Neoprene has been found superior to natural rubber for fire hose.

The 1½-inch hose is useful for small fires and for wetting down fires after the blaze is under control. It can be handled easily by one or two men.

**Playpipes and nozzles.** Standard underwriters' playpipes throw an effective stream but are difficult to handle, particularly on ladders. The short rigid playpipes with strap and ladder hook, with shut-off nozzles to prevent excessive water damage, are more suitable for plant use.

Adjustable spray and straight stream nozzles (for both 2½- and 1½-inch hose) give water curtain protection for firemen and blanket effect. They also provide solid streams for penetration.

**Water spray (fog) nozzles** are effective for oil fires. Water fog, owing to its low conductivity, can be used safely on electrical fires. Its effective range is limited to a few feet but this can be offset to some



Inner walls of fire-resisting construction with fire doors at openings limit fire areas. Fire doors should be self-closing or automatic.

## FIRE PREVENTION CHECKLIST

### Fire Extinguishing Apparatus

- In proper place ☐
- Clearly marked ☐
- Unobstructed ☐
- In working order ☐

### Housekeeping

- Premises free of combustible materials ☐
- Safe storage of flammables ☐
- Metal containers for oily rags ☐
- No leaks and drippings of flammables ☐
- No accumulations of rubbish ☐
- Passageways clear of obstacles ☐

### Electrical Equipment

- No bare wiring or badly worn insulation ☐
- Motors and tools free of dirt and grease ☐
- Ground connections clean and tight ☐
- No lights near combustible materials ☐
- Fuse and control boxes clean and closed ☐
- No poor splices ☐
- No makeshift wiring ☐

### Heat and Flame

- No smoking areas clearly indicated ☐
- Gas jets off ☐
- No gas leaks ☐
- Ashes kept in metal containers ☐
- Hot pipes clear of combustible materials ☐

NSC Safety Instruction Card No. 237

extent by using applicator pipes of varying lengths.

**Foam-generating equipment** is used where large quantities of flammable liquids are stored. For some exposures permanent generating equipment should be installed.

Foam systems may be either automatic or manual in operation. There are two types of foam, chemical and mechanical.

Chemical foam is formed by a chemical reaction in which masses of bubbles of carbon dioxide gas and a foaming agent produce an expanded froth.

Mechanical foam consists of bubbles of air produced when air and water are agitated mechanically with a foam solution.

### Limiting Fire Areas

**Fire Doors and Shutters.** For large buildings, fire-resistive partitions with fire doors are important in confining fire to a limited area. Several types of doors with varying degrees of resistance have been approved by testing laboratories.

Fire doors should either close automatically each time they are opened or be closed by a heat-actuated device if fire should break out. The most common device is the fusible link.

The releasing device should be located where it will be affected quickly by heat passing through the doorway and it should be protected against mechanical injury.

Where flash fires may occur, quick operating devices are preferable, except for doors used as exits.

**Fire shutters** are used for windows where there is an exposure hazard from adjacent buildings. Shutters may be of the swing type (tin clad or steel) or rolling steel. The latter type can be installed where space is too limited for swinging shutters.

Sliding shutters are not recommended where snow and ice might interfere with their operation.

### Wetting Agents

Wetting agents added to ordinary water increase its penetrating power. This "wet" water has proved effective in extinguishing fires in dry, dusty materials, such as hay, decayed leaves in forests, peat, cotton bales and other lightly compressed materials. In such fires a penetrating action is needed and it cannot be obtained by the velocity of the extinguishing stream.

The wetting agent and water can be mixed in pump tanks and booster tanks. A proportioner is needed for use in hose lines.

Wetting agents have certain limitations. When used in hand extinguishers they may cause the stream to spray and reduce its range.

Inhibitors are used with agents to prevent corrosion of metal containers. For tanks, a lining of asphalt or other protective coating should be used.

### Sources of Information

Specific and accurate advice on fire problems may be obtained from fire insurance carriers, local insurance inspection bureaus, municipal fire departments, National Fire Protection Association, National Board of Fire Underwriters, Underwriters' Laboratories, Associated Factory Mutual Laboratories, and other recognized agencies.



Standpipe and hose inside buildings permit fire fighters to get a stream of water on the blaze quickly.

# FIRE!



**PUT IT OUT IN SECONDS**  
*with a Kidde Portable extinguisher*

Unless you get the jump on fire the minute it starts, you stand a good chance of kissing your business good-bye.

That's why it's so important to have a Kidde portable extinguisher near *every* fire hazard in your plant.

Protect motors, electrical equipment, flammable liquids and machinery with Kidde portables. Then, when fire strikes, you're ready for it.

Just grab a Kidde CO<sub>2</sub> or dry chemical portable, aim the horn, pull the trigger, and—Whoosh! No more fire!

Your *next* fire could be your *last* . . . Contact Kidde today!

**Kidde** 

The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Freez' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

**Walter Kidde & Company, Inc.**  
**345 Main Street, Belleville 9, N.J.**

Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

# FIXED SYSTEMS

**INSTALLATIONS** of fixed systems, particularly automatic sprinklers, have proved so effective in controlling fire losses that they are generally rated as the most important means of defense against fire.

## Automatic Sprinklers

For reliable protection, sprinklers are needed wherever there is an appreciable amount of combustible material either in the building or its contents. Even fireproof buildings need sprinklers to protect burnable contents and prevent damage to the structures.

Sprinklers should be located not only to protect the ceiling but also under wide benches or tables, in closets, dryers and other locations shielded from the discharge of the ceiling sprinklers. This extra coverage is important because the heat from a fire in the unprotected area would open many more sprinklers, causing drain on the water supply and excessive water damage.

Essential parts of a sprinkler are a nozzle, a releasing device, and a deflector. The releasing device in most sprinklers is a soldered link element. Another type uses a quartz bulb containing a liquid that expands when heated and bursts the bulb. A third type uses a low-fusing chemical that liquefies at the rated temperature and allows a strut to collapse.

Various types of heads are available for use under a wide range of temperature conditions. Heads of too high a rating are slow to operate. A fire would gain considerable headway and open more heads than needed. Soldered links on sprinklers of too low a rating may become weakened and operate prematurely. For normal room temperatures up to 100 F, ordinary sprinklers are used. Where temperatures are higher, thermometer readings should be taken near the ceiling and ratings selected accordingly.

In the few cases where sprinklers have failed to function when needed, the fault has rarely been due to the sprinkler mechanism. Deficient water supply, freezing, defective dry pipe valves, foreign material in the system, corrosion, obstruction of sprinkler heads by stock piles, or paint on the sprinkler heads are among the causes.

**Wet-pipe systems** are used for most installations. Water is main-

tained under pressure right up to the sprinkler heads and operation is immediate. This type can be used only when pipes are protected against freezing.

**Dry-pipe systems** are used where there is danger of pipes freezing. Air under pressure instead of water, is maintained in the pipes. Opening of a sprinkler head releases the air pressure, resulting in the operation of a valve admitting water to the system. There is a slight delay between the opening of the sprinkler head and the discharge of water.

After a fire, sprinkler heads should be replaced promptly.

## Sprinkler Supervision

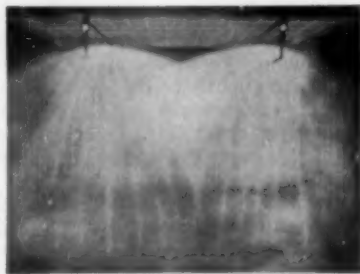
Flow of water in the system can be used to sound an alarm for fire and accidental leakage. The alarm check valve installed in a sprinkler riser can be arranged to ring a hydraulic gong or an electric bell or both.

A less expensive type, the water-flow indicator, is a paddle-like vane projecting into the piping. An electric bell sounds when the vane is deflected by flow of water.

Water-flow alarms are especially desirable where building contents are particularly susceptible to fire or water damage. They are useful supplements to watchman service. Where central station supervisory service is available, water-flow alarms are transmitted to headquarters, which calls the fire department and sends a man to the plant to investigate.

## Special Systems

For special risks, automatic systems employing carbon dioxide, foam or water spray nozzles may be installed.



Well-designed spray sprinklers give good lateral and downward coverage. (Automatic Sprinkler Corp. of America)

**Carbon dioxide** is particularly desirable where the system operates in an enclosed space and the value of the contents is high and subject to water damage. Carbon dioxide can be discharged either manually or automatically by means of heat-actuated devices.

Devices are also provided for closing shutters, doors, windows and dampers and stopping blowers to confine the extinguishing gas. These systems are suitable for spaces containing electric equipment or flammable liquids.

**Foam installations** are suitable for tanks and operations involving flammable liquids but not for electric fires. They are usually arranged to operate automatically with provision for manual operation.

**Water spray systems** are used to protect oil-filled electric equipment, such as transformers, oil switches and oil piping and open tanks of flammable liquids. To be effective, water spray systems require expert installation.

Other systems for limited and specialized occupancies use vaporizing liquid, steam and inert gases. For processes like paint dipping and tank operations using flammable liquids a manually or automatically operated cover is an effective means of extinguishment.

## Obstructed Piping

A plant's fire protection system may be crippled in an emergency when scale, stones, or other foreign material are allowed to enter or remain in the sprinkler system. Should a fire occur, the discharge from the sprinkler heads would be insufficient to check the blaze.

Regular examinations can determine whether the system contains an excessive amount of foreign material. Methods include observations of the flow from the test connection on top of the system, drain tests at sprinkler risers, or hydrant flow tests.

Uncoupling the piping at strategic points and examining the interior, or test flushing of representative feed or branch lines will reveal the presence of obstructions. Examination may show individual sprinklers to be clear but that does not necessarily mean the branch lines are clear.

Common obstructions are fine materials like pipe scale, mud, sand, small stones, cinders, and chips.

# DETECTION AND ALARMS

A **DEFINITE** fire alarm system is set up in most plants, ranging from the factory whistle to elaborate automatic systems. To avoid confusion with the regularly used whistles, special whistles or sirens are often used.

Plants in areas where municipal fire departments are available usually have an alarm box near the entrance or located in one of the buildings. Others may have auxiliary alarm boxes at various points in the plant. Another system is a direct connection to the nearest fire station which may register by a water alarm system or be set off manually.

## Signal Systems

Signal systems of various types detect fires and give alarms, and supervise sprinkler systems, water supplies, and watchmen's service.

These systems are operated on three main plans:

1. **Central station system.** Signals are transmitted to an independent central station where they are recorded and proper action for the emergency taken. The central station may serve several companies.

2. **Proprietary system.** Similar to a central station but controlled and operated by the owner of the protected property.

3. **Local system.** Owned and operated by the protected company but does not have an operator constantly on duty at a central station.



Many a fire gets out of control because an alarm is not turned in promptly.



Main control board of a typical fire-detection alarm system. Fire signals from all parts of the building are received and analyzed.

## Detectors and Alarms

Fire detection and alarm devices operate on the mechanical, pneumatic-electric, straight electric, and electronic principles.

Some of the newer types are based on some form of electronics in conjunction with thermostats. These are more sensitive than the earlier types.

Electronic devices have been installed on ships where air samples from the cargo holds are drawn through a cabinet past an electric eye or gas analyzer which detects smoke instantly and sounds an alarm. Detectors similar to the marine type can be used in many industrial locations.

Where fires may start slowly and smolder for some time, photoelectric equipment often detects smoke before heat-actuated devices are affected.

**Watchmen's supervisory systems** transmit and record signals made at watchmen's key stations. This system is frequently combined with fire alarm systems. A plant guard's failure to check in at any station along his route is promptly recorded at the control desk or panel.

Such supervision has checked many incipient fires, prevented many robberies and brought aid to watchmen rendered helpless by accident or sudden illness. It has also prevented much water damage by sprinklers.

## How Many Extinguishers?

The number of portable units required should be based on recommendations of state or local authorities or insurance carrier. Following are suggestions for exposures of varying severity:

**Class I—Light hazard.** Small amounts of combustibles and only small incipient fires anticipated.

This class includes offices, schools (exclusive of trade schools and shops), public buildings, etc.

Units shall be so located that a person will not have to travel more than 50 feet to the nearest unit. At least one unit shall be required for each 5,000 square feet of floor area.

**Class II—Moderate Hazard.** Ordinary combustible occupancies, where incipient fires of average severity may be anticipated.

This class includes department stores, warehouses, miscellaneous manufacturing of average hazard, etc.

Units shall be so located that a person will not have to travel more than 50 feet to the nearest unit. At least one unit shall be required for each 2,500 square feet of floor area.

**Class III—Extra Hazardous.** Where because of character or quantity of combustibles, extra severe incipient fires may be anticipated.

This class includes woodworking, paint spraying and dipping operations, etc.

Units shall be so located that a person will not have to travel more than 50 feet to the nearest unit, plus additional units as directed by the inspection department having jurisdiction. At least one unit shall be required for each 2,500 square feet of floor area.

## Metal Fires

Ordinary extinguishers are not effective for fires in magnesium, powdered aluminum, zinc, sodium, or potassium. For such fires an extinguishing powder known as G-1 has been developed. This is available in 40-pound pails and 325-pound drums. It is usually applied in a layer at least 1½ inches deep.

Where large amounts are needed, a wheeled applicator holding 600 pounds of powder can be used. The powder is discharged by an electric impeller through a hose and nozzle.

Combustible material should never be piled near unprotected light bulbs. Guards should be provided for these light fixtures.



# New multi-purpose 10 lb. Ansul Extinguisher

can simplify your fire protection problem



Lightweight, easy-to-operate Ansul 10-pounder gives fast, effective results even when used by women employees.



The 10-pounder stands up under rugged road use. Built to give dependable service after extreme exposure. Listed by Underwriters' Laboratories.

New rugged unit gives you high fire killing rating, light weight, modern design

The new Ansul 10-pounder is *designed and constructed* for all-around plant use—wherever dry chemical protection of this capacity is called for. It is ideally suited for truck protection, other outdoor hazards and indoor use. This multi-purpose advantage means that you have fewer models of extinguishers to service and a less complicated training program to maintain.

The high fire killing rating (B1, C1) of this unit gives you *effective* protection the *instant* it's needed. Another advantage of the Ansul 10-pounder is its light weight. This feature is important where women are called upon to lift and operate the unit. This extinguisher is also modern in appearance. It was styled by Raymond Loewy to be *seen* in any location—in the office, laboratory, plant, or on a truck.

Have the Ansul Man review your class B and C hazards, those involving flammable liquids, gases, and electricity. He will show you how the Ansul 10-pounder can make your fire protection program easier to administer, more economical to maintain.

## Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write **ANSUL CHEMICAL COMPANY**, Fire Equipment Division, Dept. F-35, Marinette, Wisconsin. Write Ansul for your copy of new Fire Equipment Catalog.



# PLANT ORGANIZATION

**PLANT ORGANIZATION** for fire-fighting may range from a few trained employees with hand extinguishers to a full-time company fire department with personnel rivaling those of some cities.

In many plants, fire protection is one of the responsibilities of the safety department. Even in larger plants where there is a division of duties, the safety department has an important part in the program.

The municipal fire department should have a prominent place in a company's fire protection plans. Its members should be familiar with the plant layout, its fire-fighting resources and its special hazards. City firemen can also give helpful suggestions on training and equipping plant fire fighters.

The plant protection force should also be trained in their part in civil defense activities and in peace-time emergencies. In many cases where communities have suffered the effects of wind, flood and fire, industrial protection and medical resources have rendered notable service.

The plant should not depend on the city fire department alone. Even under favorable conditions, it takes time for outside apparatus to reach the fire, and in many times of emergency the department might be busy elsewhere.

**Fire squads.** A squad may consist of five or six men in each department. They should act as inspectors, reporting and correcting conditions which might cause fires. They should be taught the use of extinguishers,



Training may decide whether there will be orderly action or panic and confusion when the fire alarm sounds.



A fire-protection officer stops on his rounds to make sure that extinguishers are in place and ready for use. [International Business Machines Corp.]

by actual demonstration of equipment on small fires, where practicable. They should also be impressed with the importance of turning in alarms promptly.

Men so trained will keep their heads in an emergency. They put out many fires before they do any serious damage, and also help to prevent panic.

**Fire brigades.** For the larger plant, hydrants and hose systems are basic items of protection and they need trained men to use them. Members of department squads can be members of the plant fire brigade. These men should be familiar with all details of the plant, its protective systems and water supplies. They should be drilled frequently in handling hose streams, which is no job for an amateur. Each man should have a definite task. Some should be assigned to protecting goods and machines from water damage.

**Private fire departments.** Some plants whose buildings and grounds cover a large area have full-time fire departments with motorized equipment. The department supervises the whole plant protection program and is trained in specialized techniques of fire fighting.

Any program of fire protection

should be in operation around the clock, not the main day shift alone.

**Watch service.** Watchmen are vital to the protection of industrial property. They discover and correct fire hazards, detect the outbreak of fire, extinguish incipient fires, and call help promptly when needed.

The watchman should be a mature, able-bodied man who is loyal and dependable. During periods when the regular working force is absent the safety of the plant depends to a large extent upon him.

The watchman should be familiar with all parts of the fire protection system, including sprinkler systems, valves, drains and fire pumps. He should know how to operate extinguishers.

Recorded hourly rounds for watchmen are recommended for most plants. Approved watch clock or supervisory systems give a record of calls at each station.

Many fires in manufacturing plants occur just after a plant closes down. The watchman should make his first round immediately after operations have stopped.

## Training

The following points are based on NFPA recommendations:

1. Officers and firemen should be kept fully informed on all phases of fire prevention and extinguishment. They should be encouraged to attend drill schools of the local fire department, fire colleges, etc. Books, pamphlets and magazines are available at a moderate expense that are invaluable in increasing the efficiency of the members. The rapid development of industry constantly brings new fire hazards and fire extinguishing methods.

2. Drills should be held twice a month or oftener, during paid time. The location of drills should be changed each time, so that the men will become familiar with all conditions and parts of the plant and be able to cover every conceivable emergency that may arise.

3. Drills should embrace the making of hose connections with hydrants, unreeing and stretching hose without links, coupling and uncoupling, attaching play pipes, carrying hose up ladders, over roofs and through the interior of the building. As a general rule, water should be turned on for all outdoor practice work, except during freezing weather. (This assumes rubber lined hose; unlined linen hose should not be wet.)

4. Drills should always be carried out under discipline and at a moderate pace and with accuracy.

5. All members of the brigade should be regularly examined as to their knowledge of the location of fire alarm boxes and the meaning of the various fire alarm signals.



## ALL TYPES...ANY CLASS FIRE!

Since different fire hazards require different types of fire extinguishers, PYRENE—C-O-TWO manufactures all types... the finest and most complete line on the market today.

When doing business with PYRENE—C-O-TWO, you receive unbiased advice on what is best for your particular fire hazards, whether class A, B or C.

Also, there is a well-rounded sales engineering organization having nation-wide representation to render top quality service wherever you're located.

Don't take unnecessary chances... the extensive fire protection experience of PYRENE—C-O-TWO over the years is at your disposal without obligation. Get complete facts now!



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### COMPLETE FIRE PROTECTION

portable fire extinguishers... built-in fire detecting and fire extinguishing systems

CARBON DIOXIDE • DRY CHEMICAL • VAPORIZING LIQUID • SODA-ACID • WATER • CHEMICAL FOAM • AIR FOAM





**QUESTION:** How do AKBAR Doors protect in case of fire?

**Answer:** They automatically block the opening with a curtain of steel.

**QUESTION:** How does this help?

**Answer:** It cuts off flame-spreading drafts, confines damage to the area in which fire starts.

**QUESTION:** Are the doors sure to work right if fire does occur?

**Answer:** Yes. The instant heat releases a fusible link mechanism, a strong starting spring gives AKBAR Rolling Fire Doors a positive downward push.

**QUESTION:** But what if someone is passing through the opening when the door is released?

**Answer:** A special device controls the downward speed of the doors, giving ample time to avoid danger.

**QUESTION:** What if the door closes before occupants pass through?

**Answer:** Kinnear AKBAR Doors can be raised quickly after automatic closure for any emergency need, because the torsion-spring counterbalance is not disengaged when the curtain is released.

**QUESTION:** What happens if fire should weaken or burn out the door sill?

**Answer:** A special Kinnear device stops the door positively when it reaches floor level. It will not sag or drop through, no matter what condition the sill is in.

**QUESTION:** How big can the doors be?

**Answer:** In addition to the extensive range of sizes listed by the Underwriters' Laboratories, Inc., Kinnear makes steel rolling doors with these same approved fire-safety features in any practical size.

**QUESTION:** How much extra space is needed for these fire doors?

**Answer:** Little or none. They can be mounted with the interlocking steel slit curtain flush with wall. When not in use, the doors are coiled compactly above the opening—often completely hidden from view.

**QUESTION:** Can the doors be used for regular daily service?

**Answer:** Yes—with motor operation too, if desired. But where extra fire protection is not needed, regular non-labeled Kinnear Steel Rolling Doors are recommended.

Write or call for full details on:

## Kinnear Rolling Fire Doors

The Famous AKBAR Fire Doors, made only by

The KINNEAR Mfg. Co.

Factories:

1720-40 Fields Ave., Columbus 16, Ohio

1742 Yosemite Ave., San Francisco 24, Calif.

Offices and Agents in All Principal Cities



**KINNEAR**  
ROLLING DOORS

## STATIC ELECTRICITY

**SPARKS** resulting from accumulations of static electricity are a common source of fire. They are particularly dangerous in atmospheres where there may be flammable vapors, gases and dusts.

The hazard is most severe in cold, dry weather. In warm, humid weather most surfaces have a film of moisture which helps to draw off static charges.

Static charges result from friction between small particles, or from contact and separation of two unlike substances, one or both of which are nonconductive.

Flow of gasoline or other flammable liquids through hose, or dust-laden air through non-conductive passages may produce static charges.

Static electricity is generated on dry belts, particularly on rubber or leather belts by the contact and separation of belt and pulley. Excessive accumulation of static charges can be prevented by use of conductive rubber belting.

Belts can be grounded with sharp pointed metal combs or metallic tinsel static collectors which are grounded.

Where highly flammable vapors may be present, chain drive or conductive rubber belts with metal pulleys should be used rather than combs. Conductive belts dressings are helpful if renewed frequently.

**Grounding shafting.** Shafting and metal pulleys should be grounded with carbon, brass or spring brushes or contacts.

**Powdered materials.** Finely divided materials falling through the air or blown through pipes may generate static electricity and ignite explosive mixtures of dust and air. Machines should be bonded and grounded at a number of points.

**Humidity maintained** at or above 60 per cent at 70 F. helps to prevent accumulation of static charges. High humidity is obtained by special humidifiers or steam jets installed on blower type heaters.

**Ionization** of air is also used. Ionized air contains electrically charged particles which conduct static charges to grounded parts of machines. Ionization methods include gas flames, discharges of high potential electric current, and radiation from radioactive material. These methods require expert installation

—To page 244



# 20 YEARS — BATTERY LIFE

# EMERGENCY LIGHTING

10 YEAR  
BATTERY  
GUARANTEE

## Completely Automatic

DUAL-LITE instant emergency lighting prevents panic, confusion, property damage and injury to personnel.

### MODEL CH-25 Specifications

**CASE**—Heavy duty No. 18 gauge steel. 14" x 6" x 10" grey finish.

**LIGHTING**—one or two No. 4013 sealed beam lamps, rated 25 watts each. More than 7 hours lighting for one lamp or more than 3 hours for two lamps.

**BATTERY**—Nickel cadmium, 5 cells, rated for 30 amperes. Good for 2500 cycles or 15-20 year life expectancy.

**OPERATION**—Complete automatic, on-and-off switching of lamps. Test switch and voltmeter for test checks. For use on 115 volts, 60-cycle, A.C. service. Extension cord plugs into A.C. outlet.

**CHARGING**—Complete automatic trickle charge to automatically recharge the battery over a period of days and with provision for manual switching to a fast 24 hour rate. Pilot light operates during this charge.

**GUARANTEE**—Materials and workmanship guaranteed for one year.

**\$119.**

complete  
Quantity  
Discounts



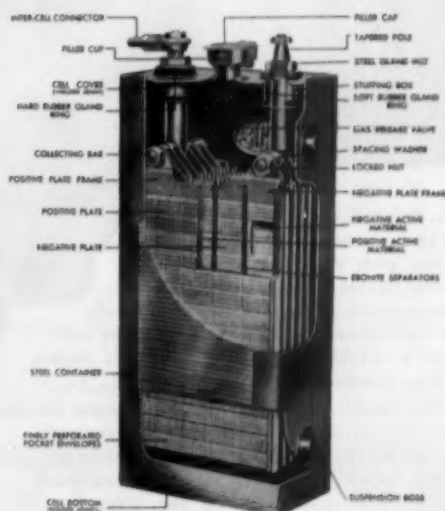
## Nickel Cadmium Battery

COMPARE MODEL CH-25 FEATURES with those of other cadmium batteries.

1. Ten year battery guarantee.
2. Life expectancy rated 15-20 years or 2500 cycles.
3. Cannot freeze.
4. No gassing on discharge.
5. Non-corrosive gases given off charge are actually beneficial because they purify the air.
6. Long shelf life—With no charges applied, this battery, standing idle, delivers more than 80% capacity after one year and more than 70% capacity after two years.
7. Nickel cadmium batteries may be left—charged or discharged—without damage.
8. Water need be added only once a year.

Nickel cadmium batteries supplied with DUAL-LITE systems are manufactured by NIFE INCORPORATED. As inventor and original manufacturer of the nickel cadmium battery, NIFE has more than 50 years experience and offers you the best nickel cadmium battery obtainable. NIFE batteries are world-famous for outstanding performance, durability,

long life, overall low cost, low maintenance, long shelf life, low internal resistance and many other features which make them dependable and economical to use. NIFE is the only battery worth consideration for emergency lighting service because it is made to perform under adverse conditions that would render other batteries useless.



**DUAL-LITE**

**DUAL-LITE COMPANY, INC.**  
187 FRONT STREET  
BRIDGEPORT 6, CONN.

and maintenance and may involve fire or health hazards.

**Body static charges** may create a hazard in areas which contain highly flammable dusts, gases and vapors. Shoes with conductive soles or heels help to drain off the charges. Their conductive value is reduced by foot powders and by wool, silk or nylon socks. Cotton and rayon are safer.

**Conductive floors** should be installed in hazardous locations. Ordinary wax and other nonconductive floor finishes reduce the value of grounding measures.

## HANDLING FLAMMABLE LIQUIDS

**FLAMMABLE LIQUIDS** are divided into three classes by the National Fire Protection Association according to flash points, closed-cup test:

**Class I. Below 25 F:**

Ethyl ether, acetone, carbon disulfide, gasoline, benzol, collodion.

**Class II. 25 to 70 F:**

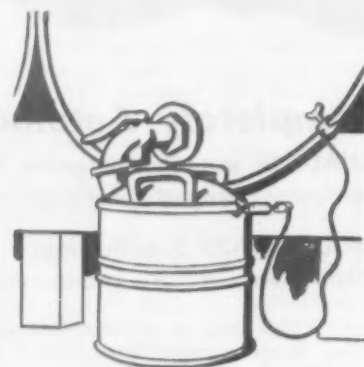
Amyl acetate, ethyl alcohol, toluol, ethyl acetate, varnish.

**Class III. 70 to 200 F:**

Stoddard solvents, kerosene, amyl alcohol, creosote oil, turpentine, fuel oil.

Portable containers for Class I and Class II liquids should be painted red.

**Safety cans**, painted red and with self-enclosing spout are available in several types in 1 pint to 5 gallon capacity. The larger sizes are



Safety can being filled with flammable liquid. Wire bond connects storage drum with can. It is also advisable to have bonding wire or receiving container grounded.

...so **EASY** to be **SAFE**

with a  
**CORBIN**  
**PERSONAL  
SAFETY  
PADLOCK**

No chance for accident... no risk of power or steam being turned on when each electrical repairman, boiler cleaner, etc., has his own Corbin Personal-Safety Padlock. Made especially for safety purposes, they have a solid die cast case, a shackle-opening height of 2 3/4 inches, and an attached metal identification tag.

Disc tumbler mechanism has 200 regular key changes and 700 possible changes when so required. Corbin P65R Padlocks can be keyed alike or master-keyed. We will gladly help you work out a Personal-Safety system based on your specific needs. For further information without obligation, write to:

**CORBIN CABINET LOCK Division**  
The American Hardware Corporation  
New Britain, Connecticut, U. S. A.



equipped with flame arresters to prevent flashbacks.

If several different flammable liquids are handled in one department, stripes or distinct lettering should be placed on the cans to avoid mixing liquids.

Containers for Class III liquids should be painted green with the warning label on the sides: "Flammable liquid—Keep fire away. Store outside building."

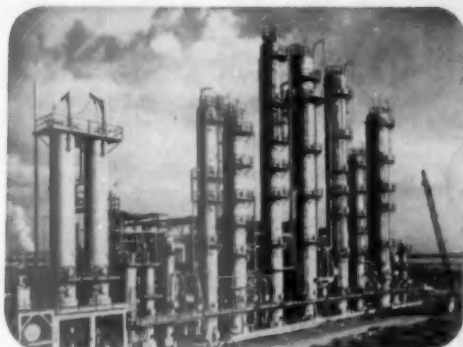
Containers should be kept clean so that the color and lettering will not be obscured.

Tank cars, storage tanks, tank trucks, connecting pipes and hose lines and filling nozzles should be interconnected with a bonding wire before an attempt is made to open connections during loading or unloading.

When flammable liquids are poured from one container to another, the lip of one container should rest on the edge of lip of the other. The two should be kept in contact during pouring and the receiving vessel should rest on a grounded surface.

**Transfer pumps** of approved design should be used when quantities of flammable liquids are handled. These pumps are self-priming and equipped with flame arresters and protected openings for pressure and vacuum relief.

# Complete FIRE-ENGINEERED Protection



Refineries, Chemical Plants



Bulk Plants, Storage Tanks



Industrial Flammable Materials



**FIRE TESTED**

**AER-O-FOAM**

Wherever flammable liquids — oil or solvent — are used or stored, you need AER-O-FOAM Protection. National Foam will fire-engineer a completely integrated AER-O-FOAM System specifically related to your operations and hazards.

National offers you "triple-guard" fire protection: (1) Custom-designed system. (2) Quality-controlled foam made by National for National devices. (3) Fire-tested foam, every batch pre-tested on a flammable liquid fire.

Don't gamble with fire. Don't buy fire equipment piecemeal. Let National fire-engineer your foam system for instant, positive protection.

Write for new, free booklet, "Foam Fire Protection".

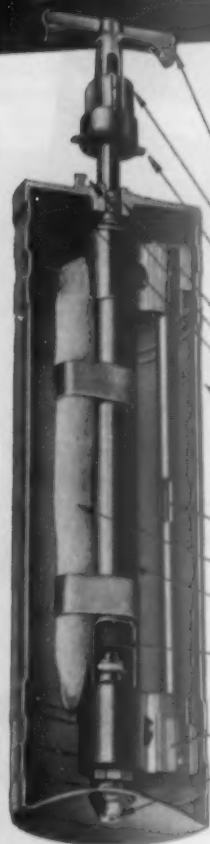


## NATIONAL

**FOAM SYSTEM INCORPORATED**

Headquarters for Foam Fire Protection — WEST CHESTER, PA.

# MORE *built-in* PROTECTION!



## VAPORIZING LIQUID EXTINGUISHERS

- FORGED BRASS HANDLE
- LEAKPROOF SEAL CAP
- CONVENIENT, EASY SHUT-OFF
- MOISTURE PROOF BREATHER
- ONE PIECE FORGED BRASS CAP and LOCK
- EMBOSSED BRASS SHELL FOR STRENGTH  
Protects pump heads
- ONE PIECE VIBRATION and SHOCKPROOF  
PICK UP VALVES
- DRYEX CORROSION PREVENTION
- INSTANT DOUBLE-ACTING PUMP
- GRAPHITAR PISTON . . . will not corrode
- REVOLVING DOUBLE END PICK UP
- RECESSED BRASS NOZZLE

**GUARANTEED FOR 2 YEARS!**

AVAILABLE IN 1 QT., 1½ QT.  
1 GALLON AND 2 GALLON SIZES

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FACTORY MUTUAL AND COAST GUARD APPROVED!**

**Y**ou get surer fire protection from Buffalo better-built extinguishers because there's more protection built-in! Highest engineering standards, exacting manufacture and precision inspection produce the finest extinguishers possible. Dealing with your Buffalo industrial distributor has many advantages. He carries a complete line of Buffalo better-built portable extinguishers, parts and recharges. Simply call him, one transaction, will answer your fire protection needs in a hurry. Call him now! He is listed in the yellow pages of your telephone directory!

**WRITE TODAY FOR THIS COMPLETE  
POCKET GUIDE TO FIRE PROTECTION!**



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**BUFFALO FIRE APPLIANCE**  
CORPORATION  
DAYTON 1, OHIO

## SPONTANEOUS IGNITION

When the temperature of combustible material is raised to the kindling point and ignition occurs with no outside source of heat, the process is called "spontaneous ignition."

Acute cases occur suddenly and explosively; in chronic cases heat generates slowly until ignition takes place.

Examples of substances subject to ignition are dry yellow phosphorus, which ignites on exposure to air, and quicklime, sodium, potassium and calcium carbide which heat when exposed to moisture.

Some materials may be stored for long periods, processed, packed and shipped with no signs of heating. The first warning may be the discovery of smoke. Uncertainty increases the hazard.

Before spontaneous ignition can occur there must be combustible material, moisture, oxygen, and a certain minimum temperature. Presence of impurities in the combustible material may affect the danger of heating.

At ordinary temperatures some combustible substances oxidize slowly and under certain conditions reach their ignition point. These include vegetable and animal oils and fats, coal, charcoal, and some finely divided metals.

Rags and waste saturated with linseed oil or paint often cause fires. In such cases there is a large surface of combustible material exposed without means for generated heat to escape.

Best preventives are either total exclusion of air or good ventilation. With small quantities of material, the former method is practicable. With large quantities, such as storage piles of bituminous coal, both methods have been used effectively.

Temperatures above 140° F are considered dangerous in coal piles. If temperatures rapidly approach or exceed that figure, it is advisable to remove the pile or rearrange it to provide better circulation of air.

Agricultural products susceptible to spontaneous ignition include sawdust, hay, grain, jute, hemp and sisal, especially if exposed to heat or to alternate wetting and drying. Circulation of air, removal of external sources of heat, and storage in smaller quantities are desirable precautions.

Fires in iron, nickel, aluminum, magnesium and other finely divided metals are sometimes attributed to spontaneous ignition. This is believed to result from oxidation of



# PROTECTOSEAL

Builds a COMPLETE LINE of **APPROVED**  
**SAFETY EQUIPMENT FOR THE**  
 Storage, Transfer and Use of Flammable Liquids!



## CONSERVATION VENTS AND FLAME ARRESTERS

provide pressure and vacuum relief, and breathing is retarded to reduce evaporation. Flame Arresters prevent passage of flame to interiors. All aluminum construction, or special materials on order. Approved and listed by Underwriter's Laboratories and Associated Factory Mutual Laboratories.



## DRUM BUNG FITTING

a combination fill and vent which provides vacuum and automatic pressure relief, and guards against explosion under fire conditions. Double perforated metal baffle extends into drum and permits refilling without danger of interior fire.

## STORAGE



## SELF-CLOSING AUTOMATIC FAUCET

has flame arrester within the body at outlet; valve is outside body where it is not distorted by excessive pressure. Standard gaskets are Buna N, Neoprene or Thiokol; other materials upon request.

## TRANSFER

### SAFETY TRANSFER PUMP

Designed for complete protection against explosion and fire hazards the PROTECTOSEAL Transfer Pump has three flame arresters built into it: at the spout, above the bung adapter and at the strainer inlet within the drum. It also provides for vent and pressure relief through protected openings.

The pump is self-priming and is constructed of special aluminum alloy with a brass telescopic tube. It is quickly and easily attached to drums with bung openings as small as  $\frac{3}{4}$ " by hand swivel grip connectors and the telescopic tube permits pumping from either the side or end openings of 30 gallon and 55 gallon drums.



## PLANT USE



**A—SAFETY CANS**—Double concentric fire baffle inside base of spout. Spring loaded cap makes tight closure; provides pressure relief. Explosion-proof and leak-proof.



**B—PLUNGER CANS**—When plunger is depressed, the fluid rises into dasher to moisten swab. Excess liquid flows back into body. Dasher is a fire-protective baffle and unit is self-extinguishing.



## C—WASH-DIP TANKS

Sturdy, square, electrically seam-welded design with lugs above liquid level to hold basket for draining. Top has full-length hinge and is equipped with a fusible link which drops cover automatically in case of fire.

## D—OILY WASTE CAN

Tight, seam-welded body with snug fitting cover which closes automatically to smother fire. Cover opens wide with slight foot pressure on full width treadle.

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- ☐ Bulk and Drum Storage ☐ Transfer Pump  
☐ Safety Production Cans for Plant Use

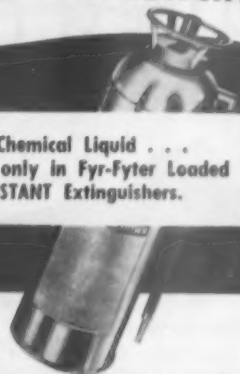
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# Fyr-Fyter's KARBALOID\*

... PUTS OUT MORE FIRE FASTER with  
LESS LIQUID and PREVENTS FLASHBACK!

HERE'S PROOF!  
ROARING TEST FIRE  
**OUT... in  
11 SECONDS!**

\*Exclusive Chemical Liquid . . .  
available only in Fyr-Fyter Loaded  
Stream INSTANT Extinguishers.

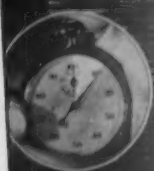


This test fire is conclusive proof of instant superiority! Karbaloid, the extinguishing liquid developed by engineers now prominent in atomic research, killed the fire in one-third time required by ordinary extinguishers . . . and only two quarts of liquid was used! Karbaloid also fireproofs as it extinguishes . . . preventing flashback or fires in rubber and other combustible materials that start up again after being put out by ordinary chemicals.

Fyr-Fyter Instant's are designed to stop the most prevalent fires in wood, rubber, fabrics and other general combustibles. They require no recharging, except after use, and need no protection from freezing. The long-range Loaded Stream can be discharged at a safe distance of 45 to 60 feet to fight flames that cannot be approached at close range. No other extinguisher provides the combination of advantages found in Fyr-Fyter Instant Extinguishers!

**Write for details today!**

This raging inferno, with flames shooting 20 feet in the air, is an Underwriters' test fire in a 100 square foot pine panel.



When fire is highest, INSTANT'S KARBALOID LOADED STREAM is aimed at fire. The roaring blaze was killed in record time . . . 11 short seconds!

TEAR OUT THIS COUPON AND MAIL WITH YOUR LETTERHEAD

☐ Send full details on Fyr-Fyter Instant Extinguisher.

☐ Send a Fyr-Fyter Representative. Let's talk it over. No obligation.

DEPT. 20

FF-3

## The Fyr-Fyter Co.

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REPRESENTATIVES IN PRINCIPAL CITIES

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cutting or lubricating oils, or possibly from chemical impurities.

Detailed procedure for prevention and extinguishment of fires in material subject to spontaneous heating is found in National Board of Fire Underwriters publications, *Preventing and Extinguishing Fires in Soft Coal*, Bulletin No. 30, and *Spontaneous Ignition and its Prevention*, Bulletin No. 51.

### Construction That Resists Fire

Fire-resistant construction is essential for any industrial or commercial building. Some types of construction can survive a fire with only minor structural damage. Building materials should be non-combustible wherever practicable, although all available materials may be damaged by extreme heat. Walls and openings should be planned to prevent rapid spread of fire.

Large areas should be subdivided by fire walls, with openings protected by fire doors. This will help to limit damage in a single fire.

For non-hazardous occupancies heavy plank roofs and floors are permissible. Heavy timbers are slow burning.

Wooden walls, joisted quick-burning floors and roofs, and inaccessible combustible spaces should be avoided.

Hazardous processes should be cut off by fire walls or fire-resistant partitions. If hazards are particularly severe they should be housed in separate buildings.

Explosion hazards require explosion-venting windows or other means of relieving pressures to minimize structural damage.

Important buildings with combustible roofs and floors should be separated by as much yard space as possible.

For buildings of more than one story, stairways, elevator wells, conveyors and chutes should be enclosed with fire-resistive walls. Fire doors should be installed at openings to prevent spread of fire to other floors.

Blank walls, fire shutters, or wired glass windows offer protection against exposure fires. Open sprinklers are an additional safeguard.

### Windowless Plants

Plants without exterior windows introduce new problems in fire fighting. These are more complicated in multi-story buildings with combustible floors and roofs.

Lack of access and delay in use of hose streams from outdoor hydrants may hamper extinguishment when there are no windows. An-

other difficulty is lack of ready means of smoke ventilation.

Automatic sprinklers will extinguish an ordinary fire as in any other building. But, if the fire is shielded, or if sprinklers happen to be shut off, serious consequences are likely.

Heat and smoke make it difficult to locate and attack a fire. This is further complicated when the lighting system is put out of service. If the fire reaches the stage where the building cannot be entered, and if the building has combustible floors and roof, destruction is almost certain.

Air-conditioning equipment can be arranged so that it can be used for smoke ventilation in case of fire. This is contrary to recommended practice for buildings of conventional construction, where air-conditioning fans are shut down at the start of a fire, and the area vented by opening doors and windows.

To remove smoke by the air-conditioning system, it is necessary to provide: (a) louvers in outside walls which will open at low positive pressures; (b) fire dampers in return duct systems arranged for automatic closing by thermostats or photo-electric cells in case of fire.

Additional exits for personnel and means of access for firemen and hose streams may be necessary. Standpipes for 2½-inch hose in stair wells or just inside fire escape access doors, and water-flow alarms on all sprinkler risers should be provided.

Fire brigades, both company and city, should be well drilled and should know what to expect in fighting fires in windowless, air-conditioned areas. Their equipment should include smoke masks and portable emergency lights.

### Flameproof Fabrics

In some cities and states, textile fabrics used in places of public assembly must be flameproofed. The flameproofing process also increases resistance to weather and mildew.

Textiles may be purchased already treated or customers may send their own fabrics to the mills for flameproofing.

Flameproofing materials are available in proprietary compounds or under their chemical names. Ingredients include ammonium sulphate or phosphate, ammonium chloride, borax and boric acid. They are usually applied to the fabric in saturated solution.

Detailed information, including materials, methods of tests, standards, etc., may be obtained from the following sources:

Textile Research Institute: Fireproofing of Textiles.

National Fire Protection Assn.: Recommended Requirements for Flameproofing of Textiles.

National Safety Council: Data Sheet DT-2, Fire Retardant Treatment for Fabrics.

National Bureau of Standards: Circular C 455, Flameproofing of Textiles.

### Incendiary Fires

Fires of incendiary origin may be the work of enemy agents, disgruntled individuals or trespassers who try to cover up theft or are merely careless with fire.

A general tightening up of plant protection measures and careful identification of employees are sometimes needed. In some cases, restricted areas may be desirable.

If evidence points to subversive activities, the regional office of the Federal Bureau of Investigation should be notified.

## OVER-LOOKING A HAZARD?

You are if you are undersignalled!

All hazardous places or operations can't be eliminated, but their existence can be identified and pinpointed with an audible or visible warning signal.

A small investment in a FEDERAL Beacon Ray light, siren, horn or bell can save a life, avoid a painful injury or prevent a mechanical failure. One such saving, translated into dollars and cents may be the difference between business success and failure.

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## SIGNAL

## Corporation

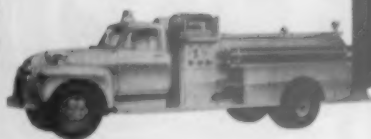
**Here's dependable protection  
for your plant and production**

**IN FOUR FEET OF SPACE**

**WE'VE PUT**

**FIRE-TRUCK**

**PERFORMANCE**



**with JOHN BEAN HIGH-PRESSURE FOG  
to knock out Fires Fast**



Two-Gun  
Self-Propelled  
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One-Gun  
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Skid-Mounted  
Stationary or  
Portable



Cabinet-Type  
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Now, there's dependable fire control for your plant — real protection for production and profits — in the complete new line of John Bean Industrial Fire-Fighters. Both stationary and miniature mobile models use the same John Bean High-Pressure Fog Pump design "one-man" hose lines and patented Fog Guns as the full-size municipal fire-trucks.

Only John Bean High-Pressure Fog, delivered at 600 pounds (or more) nozzle pressure, has such fast triple action — it cools, it smothers, it isolates flames in seconds — makes one gallon of water do the work of ten. Fires in oil, gasoline, lacquers, solvents — in any flammable liquid or material (except magnesium) — are all controlled with amazing speed.

Not only are fires stopped before they become disasters, but the usual losses from putting them out are eliminated or minimized. Because true high-pressure fog makes one gallon of water do the work of ten, you reduce water damage and save down-time on machines and production lines.

The full story is worth your investigation. Write today for your copy of the new John Bean Industrial Fire-Fighter Catalog.

**JOHN *fmc* BEAN**



Division of

**FOOD MACHINERY AND CHEMICAL CORPORATION  
DEPT. IF, LANSING 4, MICHIGAN**

## Placement of Extinguishers

An extinguisher may be useless if an employee must spend valuable minutes looking for it, or if it is blocked by piles of materials. Here are six recommended rules.

1. Locate extinguishers close to likely fire hazards but not so close that they will be in the fire zone should fire occur.
2. Place extinguishers so access to them will not be blocked by fire.
3. Install enough extinguishers to deal with any blaze which may be expected, the rapidity with which it might spread, intensity of heat, etc.
4. Mark locations conspicuously.
5. Identify each unit for the type of fire it is designed to combat.
6. Protect extinguishers from traffic.

**Marking locations.** Contrasting backgrounds make extinguishers conspicuous and less likely to be overlooked in the excitement of a fire. Methods include:

1. Painting a large red or white background on the wall.
2. A large red spot on the floor under the extinguisher.
3. Vertical red bands with yellow borders down a wall or column where equipment is placed.
4. Lights of distinctive color which do not conflict with exit lamps.

**Recharging.** Commercial carbon tetrachloride should not be used for vaporizing liquid extinguishers. It may cause deterioration of the shell and interior mechanism. Vaporizing liquid furnished by manufacturers is treated to remove impurities and to depress the freezing point.

Before recharging soda acid and foam extinguishers, the shells and all parts should be thoroughly rinsed with warm water.

**Protection from Freezing.** Carbon dioxide, vaporizing liquid and dry chemical extinguishers will not freeze.

Soda-acid and foam extinguishers should be installed in heated cabinets.

Gas cartridge extinguishers, pump tanks and fire pails are calcium chloride solutions.

## Look for the Label

Approved extinguishers carry the label of Underwriters' Laboratories and an instruction plate for inspecting and recharging, type of fire (Class A, B or C) for which equipment is recommended, and its unit rating.

An approved extinguisher must have adequate capacity. A vaporizing liquid extinguisher must contain not less than one quart of the extinguishing agent to meet recognized standards.



## Planning for Disaster Control

A **DISASTER CONTROL** plan is actually a plan to be carried out in an emergency to control the effects of a catastrophe and to restore the plant, and aid the community, if necessary.

While disaster control plans are closely tied in with civilian defense measures, their value is not limited to time of war.

They help to control panic, loss of life and destruction should a tornado, flood, explosion or conflagration strike the area. In many such disasters, industrial organizations have rendered notable service to plant and community through first aid, rescue work and fire fighting.

Management is responsible for organizing civil defense groups in plants. However, the local civil defense organization should be contacted before the organizing actually takes place.

A good place to start in organizing the group is with an employee-management committee, if one exists. If not, such a committee should be formed.

A detailed national plan has been set out in the Federal Civil Defense Administration publication, "Civil Defense in Industry and Institutions." Following is an outline of steps to be taken:

1. Choose the coordinator. In every plant there is an individual with executive ability, who has the confidence of both management and employees, who can take complete charge of the situation. For specialized information and guidance he can call upon outside consultants, such as representatives of casualty and fire insurance underwriters.

2. Make a survey of plant buildings and shelter requirements. A manual issued by the FCDA, "Methods for Determining Shelter Needs and Shelter Areas," tells what to look for and what to avoid:

- (a) Any area selected as potential shelter should be in the center of the building, away from outside exposure. "Outside" includes courts and light shafts.

- (b) Areas should be in a part of the building that is structurally compact, with close spacing of columns and short-span beams.

- (c) They should be out of direct line with doors, windows and hallways exposed to the outside.

- (d) Walls and doors surrounding the area should be free of glass.

- (e) There should be at least one interior stairway, not adjoining an outer wall.

—Turn page



## ...Install *Automatic* FYR-LARMS

FYR-LARM, the new revolutionary fire detector automatically "Screams out" a 15 minute, 95 decibel warning whistle when fire starts.

These rugged, self-contained units are easily installed without wiring or batteries.

FYR-LARMS strategically placed in your plant can avoid the possibility of extensive damage from the lurking, sneak attack of fire.

No one *thinks* they will have a fire . . . yet hundreds occur every week!

INSTALL FYR-LARMS IN YOUR PLANT & HOME TODAY . . .  
TOMORROW MAY BE TOO LATE.

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UNDERWRITER'S  
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## Wherever **SUDDEN DARKNESS** can be costly INSTALL DEPENDABLE **EXIDE® LIGHTGUARDS®**

When vital areas are plunged into sudden darkness due to power failures, these compact, plug-in emergency lighting units prevent panic, stop pilferage, maintain communications, restore service.

When lights go out, Exide Lightguards go on instantly, automatically! UL-approved, they plug into any 115-volt outlet. A dependable Exide lead-acid battery gives you positive protection. It is quickly and easily serviced. Provides exceptionally long life. The new Model M illustrated has a two rate charger—high rate or trickle.

Exide makes batteries and Lightguards for all types of emergency lighting systems: 6-volt, 32-volt, and 115-volt.



**WRITE** for latest, complete information on portable Exide Lightguards and larger Exide-powered built-in emergency systems. There's a big need, a big market for both!

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1 qt., 2 qt.  
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- Available in 5 sizes from 1 qt. to 5 gal.
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(f) Areas should contain no furnaces or boilers, and no large steam, water or gas pipes.

(g) The ceiling should not be of the hung or suspended type, or have heavy lighting fixtures or plaster ornaments.

(h) The area should be as free as possible of furniture, stored merchandise or equipment of any kind.

(i) There should be no safes, banks of filing cabinets or heavy machinery on the floor above.

Not many areas meet all these requirements so it may be necessary to pick the best space available. Hallways, corridors, fire stairs, rest rooms and elevator lobbies in the center of buildings are good locations, if free of glass.

3. Select, train and assign emergency protection personnel. These include wardens, police, firemen, engineering and rescue workers, medical and welfare workers. Local civil defense organizations have conducted many such training courses.

4. Make a floor plan showing branch control rooms, first-aid stations or cabinets, fire extinguishers and other equipment, elevators, stairs, emergency lights and exits, and a general traffic plan within the plant.

5. Post directional and information signs, including evacuation instructions, in offices and other places of assembly.

6. Provide emergency supplies in shelter areas, such as first-aid kits, water supplies, and emergency lighting. All persons assigned to civil defense tasks should be provided with civilian defense identification, such as arm bands.

Exit drills should be held frequently and include all employees. The first few drills should be announced in advance. When routine procedures have been established, drills should come at irregular intervals without warning. These drills will uncover weakness in planning, coordination and communication.

In general, the functions of the plant protective services are:

1. To direct workers to safety.
2. To rescue trapped persons.
3. To render first aid.
4. Repair damaged water mains and utility lines.
5. Fight fires.
6. Maintain morale.
7. Prevent panic.
8. Maintain order and discipline.
9. Demolish unsafe structures.
10. Remove debris.
11. Perform necessary welfare duties.

12. Effect emergency restoration of plant so production may be resumed.

The head of each protective service in the plant is responsible for training workers in his organization. In planning a training schedule he should cooperate with municipal departments and with the local civil defense organization.

Because of the devastating effects of an atomic attack, it is advisable for an individual trained in one service to receive training in other services as well. A rescue worker for example, might be able to put training in fire fighting to good use.

Teams of each protective service should be trained with teams of other services to assure coordination of activities. Training should be as realistic as possible. It should reproduce conditions likely to arise before, during and after an emergency.

The protective services should also engage in combined training exercises with the local civil defense organization. The plant's protection organization must be well integrated with that of the surrounding area to function at peak efficiency in an emergency.

## PROBLEMS OF THE NIGHT SHIFT

**NIGHT SHIFT** operation is regarded as a necessary evil by management and by most of the workers. An occasional employee will work the night shift by choice for a variety of personal reasons, but most of them resent it because it upsets their natural habits of sleeping and eating and because of the disruption of family and social life. The small extra pay for night work does not compensate for its disadvantages.

Rotation of shifts is followed in most companies which operate at night.

Most employees realize that taking their turn on the night shift is necessary but they feel that management could improve the working conditions.

**Food service** is one of the causes of dissatisfaction. When the full force is not maintained at night, the cost of operating the cafeteria is excessive. As a result, workers bring their own food, usually sandwiches with a soft drink from the vending machine. This, on top of the change of living habits, is said

to cause a high percentage of digestive troubles among night workers.

With modern lighting systems, illumination of the work places is usually at the same level day and night for most operations. Food service, first aid facilities and transportation are conspicuous among the difficulties.

Workers in some plants have the coffee pot going all night, with the company supplying the gas or electric plate. Others have rolling canteens. Vending machines can supply hot beverages and some of the more elaborate machines can even dispense hot foods.

Box lunch services are available at all hours in some localities and neighborhood diners and restaurants will sometimes send in food and coffee on order.

**Medical care.** Furnishing adequate medical care at night is another problem, especially when only a few men are employed. Where night operations are on a large scale, nurses and doctors are often on duty.

—Turn page

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PROTECTION**

against  
**FIRE  
THEFT  
SABOTAGE**



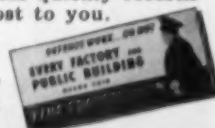
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new folder that completely describes this  
simple, low-cost, tamper-proof system of as-  
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**CHICAGO WATCHCLOCK**

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OFFICES IN PRINCIPAL CITIES

Where this is not practicable, first-aid service must be given by trained laymen, frequently the plant guards. Sometimes a doctor visits the plant at night to check first-aid facilities and give physical examinations.

**Transportation.** Infrequent bus service at night is another problem for employees who are unable to take advantage of car pools. Often management is able to make some

arrangement with the transportation company by guaranteeing a minimum number of riders.

Sometimes it is possible to lay out special routes for buses if a number of workers are living in certain areas. This is a great boon to women on night duty who are, with good reason, afraid to go home alone. On special occasions when women have to work beyond their regular night shift some companies will pay their taxi fare.

has been that such people when properly placed, are productive and safe workers. The frequently offered objection—that employment of the handicapped causes a heavy increase in compensation insurance rates—has little evidence to support it.

Proper placement of the handicapped requires, first of all, a thorough knowledge of work operations and working conditions of each occupation in the plant. This information should be evaluated by qualified specialists—production men, personnel men, safety men, physicians and psychologists. Physical requirements for each job should be established individually. They should be as strict as needed, but physical perfection is not essential to every job.

Information about available jobs in the plant should be assembled in easy reference form for use in the employment interview and in the final placement following the medical examination.

Supervisors should be made aware of the importance of any limitations placed on the types of work an individual may do safely. The formal transfer of a worker from one job to another is only the most obvious situation in which this point should

## A PLACE FOR THE HANDICAPPED

**THE BLIND**, the deaf, the crippled, the amputees, the people with bad hearts, the neurotics, and the sufferers from chronic illnesses and allergies form a substantial group of our population. If all avenues of employment were closed to them, the result would be a serious social and economic problem.

Comparatively few of these people are so disabled physically or mentally that they are permanently unemployed. Many of them have exceptional skills. A selective program

that places the handicapped person where he can work safely and productively is economically sound as well as humane.

Many companies find a place for the handicapped and accept workers with physical defects, even in times of plentiful labor supply. Most employers are willing to take care of their own employees who are injured on the job but are less ready to employ those who have been disabled elsewhere.

The experience of many companies

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1 Gal.

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Excelsior and Shredded Paper Bins - Oily Rags Towel Bins - Flammable Liquid Rinsing Cans Underwriters Approved Fusible Link Melts in Case of Fire, Closing Cover Automatically, Smothering Fire Instantly



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be considered. There is, on the shop floor, a constant temptation to shift men and work operations quickly to meet temporary or changing situations.

No amount of personnel office record-keeping will prevent mis-assignment and resulting serious hazard in such situations, unless supervisors are made strongly conscious of the need of observing all restrictions on the work operations of handicapped employees—and unless they have at hand the information on these restrictions for each employee.

A systematic method of conveying the information from department to department in cases of transfers should be established.

**Aggravated injuries.** One objection to the employment of handicapped workers is that a disability may be aggravated, or spurious claims of aggravation may be made, involving the company in increased compensation costs.

There are, of course, many types of handicaps which, for any particular type of operation, may be aggravated. Workers so handicapped should not be employed in those operations.

The best defense against possible unjustified claims is a sound physical examination, which definitely documents the physical status of the worker at employment and at intervals during his employment.

**Rehabilitation agencies.** A number of agencies are ready to serve the employer who is considering employing conspicuously handicapped people. There are state and federal rehabilitation agencies which have information on the capabilities of the handicapped generally, and also contact with individuals who have profited from rehabilitation training.

### Attack Burning Rubbish As Smog Cause

A complete engineering study of sanitary landfill for rubbish in Los Angeles has been recommended by the Air Pollution Foundation to the Los Angeles County Board of Supervisors as an aid to the city's battle against smog.

The recommendation was made as part of the Air Pollution Foundation's studies concerning smog in the entire Los Angeles Basin, which includes more than 100 communities around Los Angeles.

Pointing out that an estimated

500 tons of airborne materials are contributed to the air pollution problem in Los Angeles Basin by backyard burning of combustible rubbish, the Air Pollution Foundation recommendation stated that "no other large city in this country" was known to depend upon backyard incinerators for disposal of rubbish.

As part of its recommendation, the Air Pollution Foundation included a report from 60 of the nation's leading municipal authorities and engineers who met recently at Pasadena to discuss the economic, scientific and health effects of incineration.

Dr. Lauren B. Hitchcock, president and managing director of the Air Pollution Foundation, told the Board of Supervisors, that such burning should be discontinued "as soon as alternative means can be provided." Dr. Hitchcock said sanitary landfill was the chief alternative means.

"Backyard incinerators should be replaced by sanitary and efficient collection systems, with final disposal made to local landfills when available or distant landfills when necessary," Dr. Hitchcock said. "Engineering techniques are available to provide economic disposal without the necessity for . . . burning processes."

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as a human being



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are putting too  
much trust in a switch  
box, a coil of wire...

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matter how clever, can  
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watchclock.

☐ You may send a DETEX representative  
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## Dry Chemical Effective For Dust Fires

COMBUSTIBLE DUSTS are among  
the most serious and baffling fire  
and explosion hazards found in  
some industries.

Severe dust conditions have  
caused so many serious fires and  
explosions in grain elevators,  
starch plants, candy factories,  
bakeries, wood finishing plants,  
and coal pulverizing locations  
that fire engineers of the Ansul  
Chemical Company, of Marinette,  
Wis., recently conducted exten-  
sive tests with combustible dusts  
in an effort to learn more about  
this peculiar hazard.

After studying the causes of  
combustible dust fires and explo-  
sions, fire engineers learned that  
most materials which burn at a  
moderate rate when they are in  
large particles burn with almost  
explosive rapidity when they are  
finely divided.

This is because the finer par-  
ticles have a much greater sur-  
face area in relation to the amount  
of material in the particle which  
has to be heated to combustion  
temperature. When all of these  
surfaces are exposed to the air  
and a spark or other source of  
ignition is present, a rapid com-  
bustion occurs which builds up  
high pressure very quickly.

If the dust is not suspended  
but is lying dormant as on a floor,  
roof or beam, a smoldering fire  
will often result. However, if the  
extinguishing agent used in the  
fire stirs the particles into a dust  
cloud, an explosion can result.  
Thus, large losses have been in-  
curred in mills, with most of the  
damage due to secondary explo-  
sions caused by agitation of dust  
layers by the first explosion or  
by extinguishing streams.

The tests conducted by the An-  
sul engineers showed the value of  
an extinguishing agent which  
will provide a non-combustible  
opaque coating on the combus-  
tible dust particles apt to be in-  
volved in the fire. In addition,  
the agent must be able to be ap-  
plied so that dust clouds are not  
formed, or in those cases where  
dust agitation is unavoidable, the  
extinguishing agent must be able

to inert the dust cloud as it is  
formed.

It was found that dry chemical  
not only does this but also can  
be used for inerting dusty room  
interiors to reduce the explosion  
hazard. This is done by discharg-  
ing a dry chemical extinguisher  
into the room so that the dry  
chemical settles over beams,  
ledges and other places where the  
combustible dust may settle.

Factory Mutual Laboratories  
recently conducted tests for An-  
sul, comparing the effectiveness  
of dry chemical and talc in inert-  
ing atmospheres containing corn-  
starch. The dry chemical proved  
to be three times more effective.

To determine the effect of using  
a dry chemical extinguisher in the  
presence of relatively large  
amounts of settled combustible  
dust, cornstarch was spilled over  
the floor of the fire test building  
to a depth of 1 inch. After the  
dust was ignited, a dry chemical  
extinguisher was discharged into  
the fire. The burning starch was  
extinguished and no dust explo-  
sion or flashes occurred. Although  
a cloud of flammable dust was  
raised, the cloud of dry chemical  
was proceeding at the same rate  
and keeping the combustible dust  
cloud inerted.

Good housekeeping is a "must"  
in any location subject to com-  
bustible dust conditions, the en-  
gineers concluded. Efficient dust  
collecting systems, dust-tightness  
of handling equipment and elimi-  
nation of ledges and other col-  
lecting surfaces will do much  
toward the elimination of sec-  
ondary dust explosions. Provision  
of explosion venting windows,  
hatches, roofs and panels will re-  
duce the explosion damage to  
buildings.

Water extinguishing equip-  
ment, where necessary for com-  
plete extinguishment of com-  
bustible embers, should be of a  
type which will not deliver a  
stream of water to form a dust  
cloud, but should provide the  
water in a fine spray or fog for  
gentlest application to the dust.

Whiskey won't cure the common  
cold, says medical science. But med-  
ical science hasn't had outstanding  
success either.

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Fig. 115



Fig. 76

Single Hydrant Gate

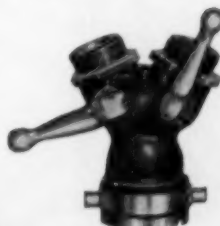


Fig. 170

New York Type Shut-Off Nozzle  
Fig. 170A furnished without Swivel Underwriter Handle.

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Lock Gear & Fireboat  
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Fig. 15953  
2 1/2" F x 2 - 1 1/2" males  
leader line - 1/4" turn  
gated Siamese.

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# MEDICAL and HEALTH SERVICE

**I**NDUSTRIAL MEDICINE has developed far beyond its original objectives. Formerly it was regarded as merely a second line of defense against accident, something to take care of the injuries that the safety department had failed to prevent.

The value of competent medical treatment of injuries—both first aid and follow up—can scarcely be overestimated. It has prevented an incalculable amount of lost time through the prevention of infection and keeping many injuries from resulting in varying degrees of permanent disability.

In first-aid service to industry, trained laymen are playing an important part. Although companies with medical staffs insist on professional treatment of all injury cases, most injured persons are first handled by laymen. And in remote locations—in mines, forests, oil fields and construction projects—life often depends on the skill of the first aiders.

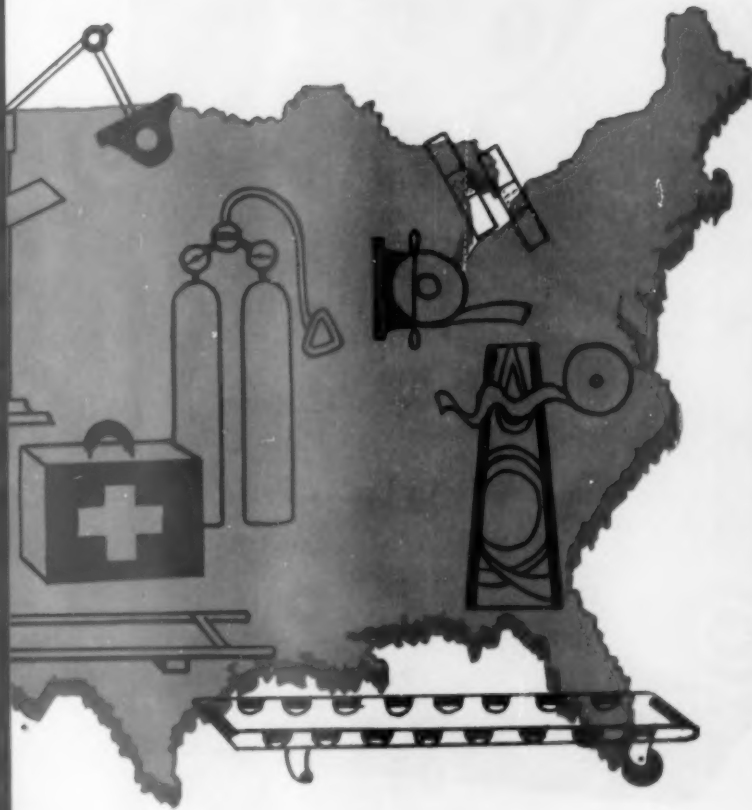
Treatment has been made more effective by the progress in the development of medical supplies for non-professional use. A comparison of a modern first aid cabinet or kit and its neat, sterile packages with the messy collection of supplies in use a few years ago would explain why fewer injuries become infected now.

Medicine's development along the preventive side—the supervision of industrial processes, the placement of employees through physical examination and general health supervision—have been of far-reaching importance both to industrial development and to public health.





## MEDICAL and HEALTH SERVICE



IN THIS SECTION	
Care of the Injured .....	261
Medical Service .....	264
Resuscitation Methods and Equipment .....	266

# now **SAFE** first aid kits with **ROUND** safety corners

## Another "first"

Round corners are safe corners! That's why MSCO now brings you unit first aid kits with *new smooth contours throughout*. No sharp edges or ends . . . nothing to cut, dig, or scratch. This *exclusive* MSCO design is especially advantageous when a kit is carried on mobile equipment. In case of accident there are no sharp parts to cut, whether a person is thrown against the kit or is struck by it as it flies through the air because of impact. And this kit is far safer when being carried by a "first aider," too. This MSCO advance is just one of the many that have been introduced over recent years—to give you and your personnel the *very best* in unit first aid. Ask your distributor for complete details.

**plus cellophane-wrapped  
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Cellophane wrapping by MSCO eliminates replacement of infrequently used units . . . makes units tamperproof, guards against pilferage . . . cuts inspection time 75% . . . gives continuous protection to every unit . . . builds extra confidence among your personnel. Units color matched to the new round-cornered kits—highly visible, extra legible buckskin tan with forest bronze. Ask your distributor for details.



## Medical Supply Company

ROCKFORD, ILLINOIS • IN CANADA, IT'S SAFETY SUPPLY CO.

# CARE OF THE INJURED

**WHEREVER** people work, provision must be made for the emergencies of accident and sudden illness. This involves the provision of first-aid facilities that meet at least minimum standards and trained personnel who know what to do—and what not to do—when their services are needed.

Prompt and skilled treatment has prevented many minor injuries from becoming serious, thereby avoiding much lost time. Sudden attacks of illness may also occur on the job, and a layman who can administer first-aid treatment and get the patient in the hands of a physician often can prevent serious consequences.

A physician or nurse should treat injuries wherever possible. Companies which have trained large numbers of employees in first aid techniques do not permit them to treat injured persons if medical service is available. Their training is strictly for emergencies.

However, most injury cases in the plant and outside, are first handled by laymen and the minutes before the doctor arrives may be vital. Many a life has been saved because some person immediately stepped in to check bleeding, apply artificial respiration, and treat shock.

Many laymen acquired skill in first aid during military service, and experience in combat showed the value of their training. In civilian life many persons have been trained by the American Red Cross and the

U. S. Bureau of Mines in the United States and by similar organizations in other countries.

Adequate care of the injured requires:

1. Trained attendants
2. Clean, convenient quarters
3. Equipment and supplies that meet medical standards
4. Well-planned organization and procedure
5. Well-kept records

This discussion is concerned primarily with the needs of plants which must depend on trained laymen, or at most a full-time nurse and part-time physician rather than those with medical staffs and hospital facilities.

**The Staff.** First-aid facilities should be under the supervision of at least a part-time physician. A full-time registered nurse is desirable, even in a medium-sized plant.

If a full-time nurse is not practicable, at least two employees who have completed standard first-aid courses should be selected to carry on the work. They should be under the supervision of a doctor or a nurse.

Attendants should be allowed sufficient time from their jobs to keep the first-aid room in order, check supplies, and keep the necessary records. One attendant should be available during all working hours.

## The Dispensary

A separate room should be provided, if possible. Patients should have reasonable privacy. If it is not practicable to partition the dispensary into a waiting room and a treatment room, a screen can be used.

The first-aid room should have:

1. Good lighting
2. Adequate ventilation and comfortable temperature
3. Basin with hot and cold running water
4. A quiet location
5. Floors of durable and easily cleaned material
6. Toilet facilities

The first aid room should be quiet, well ventilated and away from doors. Windows should be screened to keep out insects.

Furnishings should be simple and neat. The color scheme has an important influence on patients and the trend is away from the "hospital white." Walls painted with semi-gloss enamel in light tints of green, cream or buff are cheerful and easy to keep clean. A patient who is nervous or in a state of shock may be upset still more by intricate patterns on walls and ceilings.

The floor should be resilient and easy to clean. Linoleum, rubber tile, vinyl tile and asphalt tile are practical for dispensary use. Damp cloths for dusting and a sweeping compound avoid raising dust.

**Equipment.** For a dispensary with a registered nurse in charge under the supervision of a part-time physician, equipment might include:

1. Two white enameled chairs and a bench
2. Enameled top table or desk
3. Stool
4. One or more beds or cots
5. Linen and blankets
6. Waste can with cover
7. File for medical records
8. Floor lamp
9. Treatment table and instrument cabinet
10. Medicine chest
11. Small sterilizer
12. Small items of office and surgical equipment, such as basins, pitchers, rubber gloves (sterile), scissors, tweezers, forceps, hot water bottle or electric heating pad, ice bag
13. Stretcher
14. Telephone

## First-Aid Supplies

The dispensary operated under full-time medical supervision will naturally carry a wider assortment of instruments and supplies, includ-



Compact and well-equipped dispensary at plant of DeVilbiss (Canada) Limited. Acoustical tile is used for ceiling; asphalt tile for floor. Plywood walls avoid austerity yet are easy to keep clean. (The Austin Company Limited)



A first-aid kit is as much a part of the line crew's equipment as the climbing irons. Since this truck is operating where poisonous snakes may be found, a snake-bite package is included. (Medical Supply Co.)

ing many items not ordinarily used by laymen. If the first-aid room is staffed by non-medical personnel it is better to keep the setup as simple as possible.

The supervising physician should be consulted about the selection of materials, particularly when medication is involved. He should select such items as first-aid antiseptics and burn dressings.

Unit first-aid material is replacing bulk first-aid supplies for smaller plants, for small groups detached from a central headquarters, men working in isolated areas where medical help is not available, and on trains, buses, trucks and airplanes.

Unit first aid material is desirable for such groups because each dressing and treatment is an individual unit, for one-time use only. Materials can be kept in sanitary condition without deterioration for long periods. There is more likely to be a sufficient quantity and wider assortment of bandages.

To simplify maintenance of industrial first-aid kits and to establish commercial standards for sizes of unit cartons and kits, the Division of Simplified Practice, National Bureau of Standards has compiled Code R178-41 in cooperation with industry.

Kit sizes and their contents are determined by the number of persons to be protected, with consideration to the nature and frequency of injuries likely to occur. Kits come in 10, 16, 24, and 36 unit sizes. A

24-unit kit for example, would be suitable for a group of 50 men.

Specifications outlined in Federal Specifications GGG-391 (Amended) are generally accepted and used by manufacturers in the production of unit first-aid material and kits.

For operations under federal regulation, assortments have been specified although these may not fit all local requirements. Contents of kits include the following:

- Adhesive bandages
- Burn compound
- Burn solution
- Petroleum gauze
- Ammonia inhalants
- Antiseptic swabs
- Antiseptic applicators
- Tincture green soap
- Eye packets
- Bandage compresses—2, 3 and 4 inch
- Tourniquet
- Forceps
- Scissors
- Triangular bandages
- Gauze bandages
- Gauze pads
- Gauze compress
- Adhesive tape
- Aspirin or other analgesic
- Soda bicarbonate tablets
- Poison ivy ointment
- Insect repellent

If the kit is to be used in any section of the country where poisonous snakes are likely to be encountered, a snake-bite kit should be included.

The unit system does away with many of the objections to the old first aid kit but a competent and conscientious employee should be

responsible for dispensing the supplies. Employees may help themselves, often for home use, and supplies may not be replaced. Also, self-treatment should be discouraged.

For the smaller plant, ideal quarters for a first aid station may not be available but the best possible spot should be chosen. It should be readily accessible to the working zone and convenient for supervision and maintenance.

A lavatory with hot and cold running water and toilet facilities should be available.

Reasonable privacy is desirable, both for the patient and for the possible effect on those working in the area. If a separate room is not available, a screen can be erected.

Equipment may be selected from lists suggested for dispensaries, keeping in mind the limitations of space and the requirements of the plant. The following are essential:

1. Desk or table for filling out reports and records.
2. Chair or stool.
3. Filing cabinet for records.
4. Waste can with cover.
5. Bulletin board.
6. First aid manual.

#### Dispensary Records

Accurate records should be kept of all treatments. If injuries are infrequent, a small day book may be sufficient, if kept systematically. Entries should include these details:

1. Date and time of injury.
2. Date and time injury was reported for treatment.
3. Name of injured.
4. Address of injured.
5. Where and how injury was received.
6. Names, addresses and telephone numbers of witnesses.
7. Nature of injury.
8. Kind of treatment given, and by whom.
9. Whether employee returned to work after treatment; if not, when.

#### First-Aid Antiseptics

Infection of an open wound can be prevented by killing the germs already present or by removing them mechanically and preventing the entrance of more. It is in this second theory that soap and sterile water are used in aseptic treatment of wounds.

Careful and thorough washing with soap will mechanically remove the organisms and a sterile bandage will prevent entrance of more. Very few are destroyed by ordinary soaps in the process.

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# DAVIS

## 2 important new developments for greater industrial safety...

### DAVIS GASTESTER

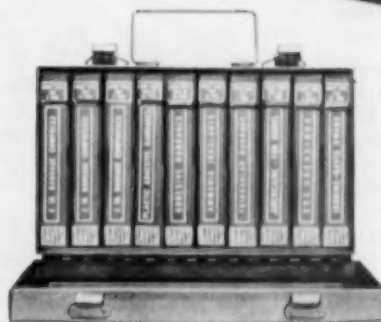
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DAVIS MEDICAL EQUIPMENT CO., INC.

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# MEDICAL SERVICE

**PROTECTING** the worker against the risks of injury and occupational diseases on the job is a responsibility shared by the industrial physician, the safety engineer and the industrial hygienist.

From its original task of patching up industry's casualties, industrial medicine has expanded its activities with increasing emphasis on the preventive phases. It is aiding the health and safety of industrial workers through:

1. Proper placement of employees through pre-employment examinations
2. Continued supervision of employee health through periodic check-ups, particularly in health-hazardous occupations
3. Supervision of plant processes

New processes and new materials, with actual or potential health hazards, have brought additional problems and opportunities to the medical department. To study and control occupational health hazards, some large corporations maintain industrial hygiene laboratories.

Smaller companies obtain help from insurance companies, state departments, laboratories maintained by universities and research organizations, and private consultants.

## Scope of Medical Program

Industrial medical service requires a definitely organized plan. It must

have management's full support but the program should be set up and operated by a physician who should be given considerable latitude in carrying out his methods and policies.

Essentials of the program are:

1. A staff of qualified physicians, nurses and attendants adequate for the organization.
2. Dispensary and hospital facilities conforming to standards established by the American Medical Association, American College of Surgeons and the American Association of Industrial Physicians and Surgeons.
3. Efficient care of occupational injuries and diseases.
4. Reasonable first-aid treatment for non-occupational injuries and illnesses while on the job.
5. Physical examinations—pre-employment and periodic.
6. Adequate records of treatments and individual medical histories. The latter should be kept confidential.
7. Supervision of plant sanitation and hygiene measures.
8. Instruction of employees in personal health and safety.

Industrial medicine recognizes the place of the private practitioner in providing medical care for the employee and his family and does not enter into competition where community medical resources are adequate.

**Hospitals.** Use of approved public hospitals, where available, is usually more desirable than setting up elaborate facilities for surgery and treatment of serious cases.

**The medical director.** Health and medical services should be under the supervision of a physician. Management and the medical director can formulate workable policies. Medical assistants, consultants, nurses, and others, should be selected on the recommendations of the medical director.

Full-time service of a physician may be warranted by the size of the plant or the nature of its operations. Sometimes a plant physician engages in private practice with the company's approval. He may devote part of his time to the industrial organization, assuming supervisory responsibility and delegating detail work to qualified assistants.

## For Smaller Plants

**Part-time service.** For a plant not large enough to warrant a full-time medical director, a part-time arrangement may be the solution. A physician who is present only part of the day should have definite hours at the plant.

With such an arrangement it is desirable to have a full-time nurse in attendance so that treatment will be carried out and complete records kept. The nurse is responsible to the physician and works under his direction.

Some plants employ medical service on a call basis, the doctor being summoned only in emergencies. This is the least satisfactory type of service. Under such a setup, the physician is not likely to develop a real interest in the company, nor will he be able to do effective educational work.

**Cooperative services.** Where several small plants are close together, a cooperative medical service program can often be carried on successfully. A central dispensary with the necessary personnel and equipment is maintained. Adequate service can be made available at moderate cost.

## Physical Examinations

Pre-employment examinations have become standard procedure in many companies. Their purpose is to place each employee in a job suited to his capacity rather than to bar anyone from a job.

Periodic checkups are desirable, particularly for elderly employees, for those in jobs where safety de-

—To page 266



Mobile clinics bring health and medical service to employees in scattered operations. This one is a complete laboratory on wheels. (Medical Coaches Inc.)

# ...planning or improving a dispensary?



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PHYSICAL  
EXAMINATION  
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## .....let aloe help you

Modern industrial health care is increasingly concerned with the general health of employees as well as the routine treatment of the injured. If you plan to expand existing facilities or establish an entirely new department, A. S. Aloe has a planning department staffed with medical equipment experts, prepared to help you with layouts and suggested equipment lists. Our planning service is designed to save valuable time and relieve you of the burden of endless detail in preparing floor plans, check lists, etc. The illustrations above show the Aloe-equipped medical and laboratory installations of the Atlas Powder Company's plant in Chattanooga, Tennessee. Here, the employee is placed in an atmosphere equal, in every respect, to that of the private physician's office, and is therefore relieved of any possible doubt that he is the beneficiary of superior medical care. Please write for complete details.



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## RESUSCITATION METHODS AND EQUIPMENT

**ARTIFICIAL RESPIRATION** applied by trained persons has saved thousands of lives in cases of suspended breathing due to asphyxiation, drowning, electric shock, and other causes.

The Arm-Lift, Back-Pressure Method, recently introduced, has been adopted officially by the American Red Cross and other organizations, and is being taught to an increasing number of persons.

This method can be applied immediately without apparatus, which is important in all cases of suspended respiration. It is more efficient than the Schafer prone pressure method which was widely taught for many years and saved many lives.

**Mechanical resuscitators** are used by fire departments, hospitals and by some industries where asphyxiation or electric shock hazards are serious and where apparatus and trained personnel are immediately available.

Such apparatus can be used where injuries to the patient might prevent use of manual resuscitation. It also gives more air exchange and does not get tired.

Mechanical resuscitators are for use only by persons trained in their operation. The American Medical Association lists devices accepted for use by hospitals and medical departments.

The **inhalator**, which supplies oxygen to the patient under low, continuously positive pressure, is used with manual resuscitation. It is particularly valuable in cases of gas asphyxiation and has become part

of the equipment of fire departments and rescue squads. The inhalator, by itself, does not produce respiration and should not be confused with mechanical resuscitators.

Use of pure oxygen, rather than the mixture of oxygen and carbon dioxide formerly used, is recommended by the Council on Physical Medicine of the American Medical Association.

Some types of apparatus combine the functions of resuscitator, inhalator and aspirator, restoring breathing, administering oxygen and removing from the throat secretions which might hinder breathing.

The "Eve" or rocking method uses a stretcher over a support on which the patient is see-sawed up and down. This method is used by the British Navy and the U. S. Coast Guard. A folding stretcher and support can be carried in an automobile.

Application of manual resuscitation should never be delayed while waiting for apparatus.

### Medical Service

—From page 264

pends on physical fitness, and where there is exposure to health-hazardous materials.

Examinations include vision, heart, chest, blood pressure, hearing and urinalysis. Tests in some industries require rather elaborate laboratory facilities and highly trained personnel.

**Laboratories.** For most industries, facilities for taking urine tests and blood counts are needed. Blood serum samples can be sent to a local or state laboratory for analysis. Where a large volume of toxicological tests is conducted, a complete laboratory at the plant may be desirable.

**Vision.** Several devices for testing visual acuity and classifying workers for jobs are available. These devices can be used by trained laymen. Employees showing visual defects are referred to ophthalmologists or optometrists for further tests.

**Hearing.** By means of the audiometer, acuteness of hearing can be determined and treatment indicated. Any progressive loss of hearing, through noisy work or other causes can be measured.

**Chest.** For many occupations, pre-employment and periodic examinations include X-rays of the chest. Mass chest surveys are made at regular intervals in industries where health hazards require frequent checks, and in public health campaigns to detect incipient cases of tuberculosis and cancer.

Trained technicians with mobile equipment can be engaged to conduct mass X-ray surveys.

### Consultants

The medical director, like the private practitioner, is not an expert in all branches of medical sciences. Both find it necessary at times to call on specialists when diagnosis is uncertain or treatment requires specialized techniques.

**Surgeons.** In all surgical cases where there is danger of inaccurate diagnosis or inadequate treatment, outside consultation should be called in early. Frequently, the administrative and diagnostic ability of the medical director is more important than his skill in surgery. The plant physician should refer all cases which might be beyond his training and experience to a specialist or surgeon.

**Oculist.** Injuries to the eyes are among the most frequent of occupational injuries. The importance of the eyesight justifies obtaining the

### MEDICAL FACILITIES

#### Recommended Standards

1. In plants of 500 or more, a full-time nurse should be in attendance. A physician should be present at the daily dressing hour.

2. Number of treatment rooms:

50 to 500 employees.....	1
500 to 1000 employees.....	2
1000 to 5000 employees.....	3
5000 to 10,000 employees....	5

3. For plants of more than 1,000 employees the dispensary should be equipped with bath and toilet, equipment for minor surgery, and other apparatus and supplies selected by the physician in charge.

4. One or more beds should be provided where severe cases may be made comfortable during observation or while waiting for transportation to a general hospital.

5. An X-ray room, if facilities are not available in a local hospital or physician's office.

6. The hospital should be under full charge of the company physician.



Mechanical resuscitators give more air exchange than manual resuscitation and do not become tired. Apparatus should be used only by trained operators and manual methods should be used without delay while waiting for equipment. (E. & J. Mfg. Co.)



highest available skill. Specialists should be summoned in all potentially serious cases.

Ophthalmologists and optometrists can also serve industry in correcting defective vision among employees. The employee should, of course, have the privilege of choosing his own refractionist but frequently he will ask the advice of the medical department on the selection of a specialist. Where prescription goggles are indicated, some companies provide the examination.

**Dentists.** Injuries to the teeth are relatively infrequent in industry and such cases are usually sent outside for treatment. The medical department should have a list of dentists qualified to treat such injuries.

The importance of oral hygiene has led many companies to provide dental examinations, sometimes including full-mouth X-rays. The findings are usually referred to the employee's dentist since few companies provide restorative dentistry.

#### Health Agencies

Among the agencies furnishing helpful data on general and specialized phases of medical service, first aid and industrial hygiene are the following:

United States Public Health Service  
United States Department of Labor  
American Standards Association  
Industrial Hygiene Foundation  
Atomic Energy Commission  
State and Municipal Health Departments

**Mobile clinics.** A recent development in industrial health service is the mobile clinic which makes it possible to extend medical coverage to more employees. The simplest type, which consists of a trailer towed behind a car or station wagon, is equipped to give some of the simpler tests. Most elaborate is a

bus type vehicle housing facilities for visual, hearing, and x-ray examinations, which is practically a self-sufficient medical department and laboratory on wheels.

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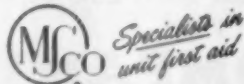
Getting Facts About Occupational Dermatitis—May 1950.

# BURN! PAIN... SHOCK... SPRAY IT!

... the best and safest method for the "first aider" because he doesn't touch the patient!

#### QUICK, THOROUGH, PAINLESS, ASEPTIC...

Doctors agree that certain basic conditions are present in all burn cases. The "first aider" is qualified only to deal with the first three: Relieve Pain, Prevent Infection, Treat Shock. Spraying burns does this best. And the MSCo assortment of Burn Spray Kits is the largest ever offered: Americaine or Kip Antiseptic Oil in either compact Unit-Type Packets with Pressure Cartridge Spray or Complete Burn Spray Kits with Aerosol Dispensers; Foille and Hydrosulphosol Burn Spray Kits; Fire Department Kits. MSCo also supplies all standard burn ointments in unit form for first aid kits. See your MSCo distributor for a demonstration or write for details.



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National Safety News, March, 1955

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## Vaseline Sterile Petrolatum Gauze

especially adapted to a wide range of uses.

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1" x 36" strips, in individual sterile-sealed foil-envelopes, 6 envelopes in carton.

other sizes:

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3" x 36" strips, 6 to carton

6" x 36" strips, 6 to carton

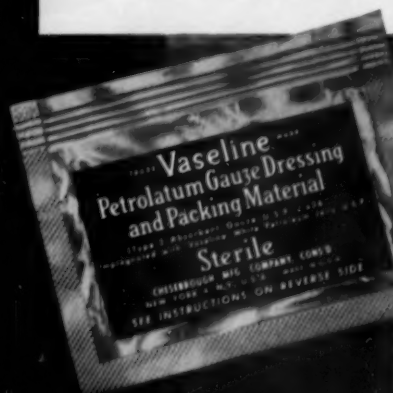
If it's Vaseline® Petrolatum Gauze it's sterile at the time of use.

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Developed to meet the widespread demand for a narrow dressing for small area burns and abrasions, for finger and hand injuries, for numerous other first-aid applications.



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Hundred Million Dollar Loss—Louis Schwartz, M.D., Feb. 1952.  
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#### Care of Injured

—From page 262

Many substances will kill germs in a test tube but a successful first-aid antiseptic must kill them in the presence of body substances and not kill too many of the body cells at the same time. Choosing the proper one is something of an art and for this reason should be left to the doctor in charge.

Corrosive sublimate (mercury bichloride), for instance, is very effective except for its bad effect on tissues. Compounds such as merthiolate, merphenyl and mercurochrome are devised to get the antiseptic properties of mercury without its toxic effects.

The halogens (tincture of iodine and Dakin's solution) have been

widely used because of their strong oxidizing action. They are even stronger than hydrogen peroxide which is used for the same reason.

The various antibiotics (sulpha compounds, penicillin, terramycin, etc.) are not antiseptics although they are very useful in treating infections. They should be used only under medical supervision because their use is not without danger.

#### Transporting the Injured

Where there is any doubt about moving the patient, medical aid should be brought to the scene of the accident, if at all possible. Lifting a patient into a car may aggravate injuries.

Before the patient is moved he should be treated for possible shock. Fractures should always be splinted.

Stretchers. The army type is easy to handle. It can be used as a cot at the scene of the accident, in transit, and at the first-aid room or hospital. It is frequently stored in a canister in a conspicuously marked spot to keep it clean and ready for use.

Collapsible stretchers may be folded when not in use and carried

## 'PAC-KIT' FIRST AID

MODERN UNIT TYPE  
FIRST AID EQUIPMENT  
FOR EVERY EMERGENCY



'PAC-KIT' provides standard products packed in individual cartons with illustrated First Aid Instructions. Electrically welded 20 gauge steel, dust and moisture proof cases provide complete protection of contents and long service.



No. 748 SNAKE BITE KIT  
SUCTION FIRST AID



Easily operated with one hand. ANY-ONE can give effective first aid. KIT CONTAINS: Tourniquet, Lancet and Suction Syringe, with

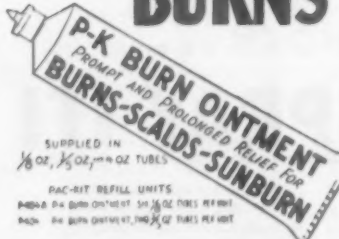
- 1 Curved Rubber Suction Cup
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- 3 Iodine Applicators
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Wt. complete in metal case, 7 ozs.

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Scalds—Sunburn—Windburn

P-K BURN OINTMENT provides immediate and sustained relief. It is a soft Lanoline base cream with an effective analgesic.

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in an automobile. Some are equipped with wheels and an adjustable head rest.

Bandages, splints and stretchers may be improvised in emergencies when regular equipment is not available. Improvisation is part of first-aid training. Where men are at work, however, approved first-aid equipment and supplies should be kept on hand.

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#### Wiping Cloths Carry Safety Slogans

Cotton shop towels have definite advantages over salvaged rags as wiping material. They are uniform in size and weave with edges bound. The sturdiness and tensile strength

of heavy cotton cloth makes it safer than paper where work is done around metal chips and turnings or on sharp surfaces.

Cotton towels promote better housekeeping since they must be turned in to get fresh ones, while rags or paper wipers may be dropped on the floor, in corners and behind machines.

Something new has been added to industrial wiping towels in the form of imprinted safety slogans which are said to be resistant to laundering. One way of using them in a safety program is for the safety director or a supervisor stop an employee and ask him the slogan imprinted on the towel. If he knows the slogan, or that the towel has no slogan—just the name of the supplier—he is rewarded with a silver dollar.

These towels, which were introduced by Industrial Wiping Cloth Company, Long Island City, N. Y., are furnished through industrial laundries.

#### Hiring Handicapped Won't Raise Premiums

Hiring handicapped workers does not increase workmen's compensation insurance premiums, Roy L. Davis, manager of the Chicago office of the Association of Casualty and Surety companies, told a recent meeting of the Iowa Heart Association at Des Moines.

Davis labeled false "perfidious rumors which one still hears" that employers are being advised by companies carrying workmen's compensation insurance not to hire physically handicapped workers.

"Workmen's compensation insur-



MOSQUITOES, ticks, chiggers, all biting insects have no place to land when your workers use PELLENT. Three types: Ointment for regular use... Cream that won't sweat out, only soap and water will remove... Spray for clothing. PELLENT does not stain... lasts for hours! Unit 204A Ointment (6½ oz.)... \$0.60, Unit 205AA Cream (2 oz. plastic)... \$1.00, No. 320 Pellement Spray (5 oz.)... \$1.00. Order from your MSCo distributor today.



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Rockford, Ill., in Canada, it's Safety Supply Co.

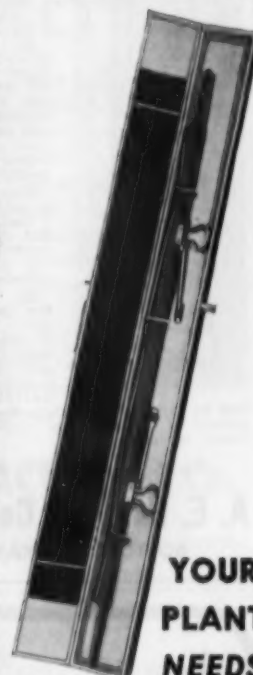


Double amputee at Ohio State Rehabilitation Center, Ohio State University, uses special board to learn use of artificial hands.

## JUNKIN STRETCHERS

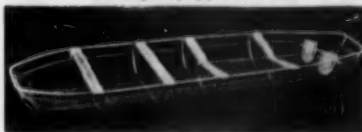
### STRETCHER CASE

**\$23.80** FOR Louisville



**YOUR PLANT NEEDS STRETCHERS**

The Junkin Stretcher Case affords a convenient and compact cabinet for storing the army type stretcher, blankets and first aid equipment. It provides a definite location for the equipment and protects it against the deteriorating effects of dirt and grime. And because it's compact it's a SPACE SAVER tool Comes fully equipped if desired.



#### JUNKIN SPLINT-TYPE STRETCHER

Construction permits patient to be carried horizontally or lifted vertically without danger from inaccessible locations. Canvas straps and footrests keep patient rigid and comfortable. For complete information write for free descriptive literature.



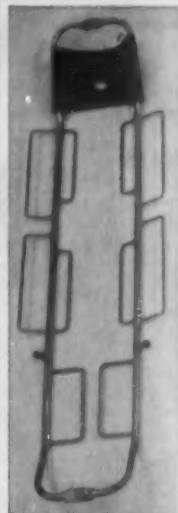
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## A REVOLUTIONARY NEW STRETCHER!



The most significant advance in Stretchers since the introduction of the folding type, collapsible, Stretch-er!!

The Robinson Orthopedic Stretcher permits attendants to carry the injured to the first aid station without moving the injured person and causing further and oft-times, permanent injury.

This Stretcher is adjustable to 7 feet, 3 inches and can support patients weighing up to 300 pounds.

By loosening the base pivot and spreading, the attendant adjusts the Robinson Orthopedic Stretcher to the desired length

and by bringing the sides together, the patient is "scooped up" without additional movement.

For full particulars, write:

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Poison ivy, poison oak, poison sumac, all are finding ZIRCROME a tough enemy! For MSCO A-20 ZIRCROME contains ZIRCONIUM... the latest medically proved treatment for poisonous plant dermatitis... widely accepted by leading dermatologists and the medical profession. It's the newest approach to the poisonous plant hazard. In two sizes: 1/4 oz. tubes for unit system and 1 lb. jars for clinical use. See your MSCO distributor, or write for free clinical data and poisonous plant identification guide.



**MEDICAL SUPPLY COMPANY**

Rockford, Ill., In Canada, It's Safety Supply Co.

ance rates are determined by two factors," he said. "These are the relative hazards in a company's work and its accident experience. The formulas for determining the premium rates make no consideration for the kind of personnel an employer hires.

"Whether a company is staffed with workers having two legs apiece, or one, or none, influences the rates not one bit."

A relatively high number of claims over a period of time will result in an increase in an employer's compensation insurance rates, Davis asserted. If a disabled worker were more likely to have accidents than other workers, he could be a factor in increasing his employer's insurance rates.

"But—and this should not be forgotten—research studies conducted by both government and industry agencies have shown that when placed in the proper jobs the handicapped have an accident experience that is as good as their able bodied fellows, and is often superior," Davis said.

## Mine Safety Pioneer Honored by AIME

A man who has labored more than 44 years to make mining a safer occupation was honored for his achievements by the American Institute of Mining & Metallurgical Engineers during the organization's annual meeting February 16 in Chicago.

He is George H. Deike Sr., board chairman of Mine Safety Appliances Company, Pittsburgh. Mr. Deike received the AIME's Erskine Ramsay Gold Medal Award "in recognition of his achievements in bituminous and anthracite coal mining." The presentation was made by AIME President Leo F. Reinartz, vice president of Armco Steel Corp., Middletown, Ohio.

Mr. Deike started his business career as a mining engineer after he was graduated from Pennsylvania State University in 1903. In 1911, he joined the newly formed United States Bureau of Mines and worked in the Mine Rescue Division.

In this position he saw at firsthand the tragedy and horror of mine disasters. An average of 2657 coal miners were killed annually in the five years from 1906 through 1910.

At the Bureau of Mines, he met another engineer, John T. Ryan. The two men decided, in 1914, to form their own company to provide miners with equipment that would eliminate many of the perils of mining.



George H. Deike, a founder and chairman of the board of Mine Safety Appliances Company (left) receives the Erskine Ramsay Gold Medal Award at the annual meeting of the American Institute of Mining and Metallurgical Engineers. Presenting the award in recognition of Mr. Deike's achievements in bituminous and anthracite coal mining is Leo F. Reinartz, vice-president, Armco Steel Corp. and president of AIME.

Thus, Mine Safety Appliances Company was founded.

Among the achievements of Mr. Deike and the company was the introduction to mining of the first electric cap lamp. Investigations of mine explosions in the early 1900's by Mr. Deike and others at the Bureau of Mines showed that 75 per cent were caused by open-flame lamps. Learning that Thomas A. Edison was developing a nickel-iron-alkaline storage battery suitable for miners' cap lamps, the young company asked to represent him in distributing the equipment to mines.

After the Bureau of Mines approved Edison's miners' lamp in 1915, MSA was appointed worldwide distributor. Mr. Deike personally made the first sale of Edison lamps to a mine in West Virginia where 22 miners had been killed a few days earlier in an explosion touched off by an open flame lamp. Since then, more than 700,000 Edison miners' lamps have been marketed by MSA throughout the world.

In 1924, MSA manufactured the first commercial rock dust distributor. It applies incombustible dust on mine interiors to dilute the highly explosive coal dust and prevent a build-up of a series of explosions.

Mr. Deike has devoted much of his time to organizations dedicated to making mines safer places in which to work. He is one of seven coal industry men who founded in 1924 the National Mine Rescue Association, originally called the



Smoke-Eaters Association, and is a former president of that group.

Mr. Deike also served as president last year of the Mine Inspectors Institute of America. He is a pioneer member of the Western Pennsylvania Safety Council. Among the other organizations of which he is a member are the American Society of Safety Engineers, Mine Rescue Veterans Association and the Coal Mining Institute of America.

At the age of 76, Mr. Deike now is active in developing interest of young men in careers as mining engineers. He is vice president of Pennsylvania State University's Board of Trustees, having served on the board for nine successive three-year terms.

### Cleanliness in the First-Aid Room

**TREATMENT** of any injury requires surgical cleanliness of instruments and materials and rigid precautions during treatment. Until the wound is healed, there is opportunity for infection.

To the physician and the nurse, cleansing the hands thoroughly and keeping equipment and supplies free from contamination have become second nature. The first-aid attendant, called from his job to treat an injury, may overlook these important precautions.

Supplies (bandages, gauze, instruments, etc.) should be kept in cabinets. Supplies purchased in packages remain sterile until opened. Unit dressings are favored in many dispensaries under medical supervision and should always be used when a part-time attendant is in charge and for isolated groups.

With individually packed dressings there is no waste and no contamination of unused supplies. A useful item is the finger compress which can be applied without touching the part that comes next to the wound.

After treatment, instruments should be cleaned and sterilized and allowed to dry. Soiled dressings should be disposed of out of sight of patients. A closed can with self-closing foot-operated cover is a useful item.

Sterilizers are used to sterilize instruments such as forceps, tweezers, etc., by subjecting them to boiling water or live steam. Boiling for 10 minutes is advised.

Hands cannot be made absolutely sterile but reasonable standards of personal cleanliness should be maintained. While the packet system

## STATION WAGON CONVERSION UNITS By Bomgardner!!



Convert your station wagon to an auxiliary ambulance in a matter of minutes. Let the world's oldest and foremost designers of emergency equipment show you the safest in holding equipment, cots and stretchers for your station wagon.

Buy the best. Insist on Bomgardner equipment, acknowledged by leaders of safety everywhere as the finest ever produced. Write for additional information.

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## EMERSON Resuscitators

"Simplest and Safest"

**SIMPLE** to operate.

**SAFE** for adults, children, or infants.

**ACCEPTED** by the American Medical Association since 1942 for use by laymen.

**PROVIDE SUCTION**, alternating with pressure, to give vital aid to the circulation. Write for free Medical References on Resuscitation.

**NOTE:** The first few minutes after breathing has ceased are the most critical. Manual artificial respiration should be started immediately and continued until the resuscitator is in use. Write for free bulletin, *Emerson Method of Artificial Respiration*.



**J. H. EMERSON CO.**  
CAMBRIDGE 40, MASS.

makes it possible for a person with dirty hands to apply a sterile dressing without contaminating it, only an emergency would justify it.

For the first-aid room, clean towels (cloth or paper) and soap, preferably liquid or powdered in a dispenser, should be available. A nail brush should be used.

Wash-up then proceeds as follows:

1. Clean finger nails by scrubbing with soaped brush and warm water, up and down the nails and across the finger tips.

2. Then scrub inside of hands and between fingers.

3. Then outside of hands and arms beyond the elbow. A short-sleeved shirt or jacket is recommended.

4. Rinse so that water runs off the elbows. Finally, wash with a sponge dipped in alcohol.

Patient's clothes or hands should not come in contact with a wound during or after treatment. Wounds may also become infected by secretions from the nose or throat of the patient or the attendant.

If extensive dressing or cleansing of a wound is indicated, the patient should be placed in a comfortable position and the injury covered temporarily, after any severe bleeding has been checked.

## Material Handling Show To Be Held in Chicago

A conference on materials handling techniques, conducted by the engineers who use the equipment, will be held in conjunction with the National Materials Handling Exposition at the International Amphitheatre in Chicago, May 16 to 20.

The announcement was made jointly by the American Material Handling Society, which will sponsor the conference, and Clapp & Poliak, Inc., New York exposition management firm which founded and produces the show.

The Chicago section of the society will act as host and will prepare the program. D. A. Gillespie, society president, has appointed L. J. Riege, materials handling engineer, United States Gypsum Company, Chicago, as chairman of the conference.

The society has more than 4,000 members in most of the major factories in the country. It is devoted to advancing the science of materials handling.

"American industry is faced with a gigantic task of bringing its materials handling system up to date,"

a joint statement of the society and the exposition management said. "The importance of materials handling was scarcely understood in 1947, when the first exposition in the field took place. Despite the relatively recent introduction of this equipment, much of it is obsolete."

## Paper Containers Carry Safety Reminders

Among the media for spreading safety slogans and other reminders are various types of paper products.

Paper cups bearing safety reminders, for example, are now being produced by several companies for plant canteens and cafeterias and industrial caterers. These often carry the "Green Cross for Safety" emblem, which has high attention value.

Paper napkins imprinted with safety messages are also used in some plants.

For customer distribution, paper bags and wrapping paper and pressure-sensitive tape may also carry slogans.

## WHEN SECONDS COUNT!



PATENT APPLIED FOR

### IPCO "WASH-AWAY" BOTTLE

Medical authorities agree that immediate washing with plain water is the first requisite in the event of corrosive material entering the eyes, seconds saved between contact and eye washing being a determining factor in the degree of eye injury.

The IPCO WASH-AWAY BOTTLE was developed as a means of providing individual workers or small groups with a supply of

water within reach for immediate washing of the eyes in the case of accidental exposure. . . . Bottle of unbreakable Polyethylene plastic provides a continuous flow of 7 to 8 minutes duration. A sound first-aid procedure.



WRITE FOR BULLETIN NO. 91

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## when a life hangs in the balance—



Haggard's SAVE-A-LIFE . . . a combination litter and splint, designed for modern accident

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### COMPACT, FOOLPROOF

Folds for back-pack or car-trunk. Goes easily through small, narrow openings, up stairways. Fits seat-tops of any automobile. WRITE for folder, prices, names of prominent users.



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FOLDING STRETCHER and fracture board

## Preventing Welding And Cutting Fires

1. All operations should be restricted to a predetermined area and before portable units may be moved, the written consent of a competent official must be secured. The location must be carefully examined by the official before signing permit.

2. No cutting or welding to be done while sprinklers are out of service.

3. Equipment must not be used in presence of flammable vapors and liquids or tanks which have previously contained such materials.

4. Floors and surroundings must be swept clean and wet down. All combustibles should be relocated 30-40 feet away; cover remainder with asbestos curtains, metal guards or flame-proofed covers (not ordinary tarpaulins).

5. Extra men should be provided to watch sparks and ample fire protection equipment, such as hand hose, extinguishers, water pails, etc., should be provided. When operations are in combustible buildings, a man should be stationed on the floor below and possibly on the floor above. The areas including the floors

above and below the one on which the operation is performed should be patrolled for at least a half hour after the work is completed. If near the shutdown period, the remaining employees or watchman should also be notified.

6. Keep the cutting and welding equipment in good repair at all times; soapy water should be used in testing for leaks.

—Factory Insurance Association

## Public Water Systems May Fail

Most people seem to consider that public water systems are infallible. The general record is excellent. They are, however, subject to a variety of accidents which may suddenly put a plant entirely on its own resources.

Damage from floods, failure of obsolete equipment, freeze-ups, power failures, etc., have all occurred to hamper the supply of public water.

In one case, a 30-inch supply main, the sole link from the reservoir to an industrial city, broke, leaving plants without fire protection. Long single supply mains of this sort are

particularly vulnerable spots in water systems.

Shortage of water due to droughts is a problem that arises frequently and has been particularly serious in many communities in recent years.

Growth of population and increased industrial activity are all known factors that are making supplies inadequate in some communities. While, in most cases, these conditions are being remedied as fast as possible, they present a problem which may be accelerated.

Water supplies to supplement a public water supply at a plant are furnished by gravity tanks, by fire pumps taking suction from open bodies of water or from suction tanks, and occasionally, by private gravity reservoirs.

These supplies must be checked often to insure reliability. This includes maintaining adequate levels in tanks and reservoirs, checking pressures in mains and sprinkler systems and testing fire pumps.

Statistics show there are three ages when men misbehave—young, old, and middle.



Poison ivy, poison oak and sumac no longer need bother your men when they use MSCO POISON IVY OINTMENT for prevention or cure. Remember, MSCO is headquarters for poison ivy first aid: Unit A-20 Zircreme, 6 per unit; Zircreme (clinical) 1 lb. jars; Unit A-17 Poison Ivy Ointment, 6 per unit; Unit 102A Poison Ivy Wash, 4cc., 6 per unit; Unit 164A Poison Ivy Wash, 10cc., 3 per unit. See your MSCO distributor, or write for illustrated poisonous plant identification guide.



**MEDICAL SUPPLY COMPANY**  
Rockford, Ill., In Canada, It's Safety Supply Co.

National Safety News, March, 1953

## Your Workers DESERVE it

Eye trouble is like the serious diseases that take the most human lives: *If caught early, it's not dangerous—but if neglected, vision suffers.*

You can give this protection to your employees at a cost of less than 25¢ each.



## Your Plant NEEDS it

44% fewer accidents are reported by plants installing tests to make sure each employee's eyes are working efficiently TOGETHER. Also 20% reduction in spoilage, 45% saving in training costs, 37% less absenteeism . . . and higher production.

No plant can afford workers with UNHAPPY EYES.

KEYSTONE VIEW CO., Meadville, Pa.

Please send booklet telling WHAT PLANTS HAVE ACCOMPLISHED WITH VISION SCREENING.

(Name) .....

(Company) ..... (City) .....



# SAFETY PROMOTION and TRAINING

**E**DUCATION, as the term is commonly used in safety work, covers a variety of techniques all planned to teach safe methods of work and to promote a favorable attitude toward the safety program. The principles and appeals of advertising and psychology have been applied freely.

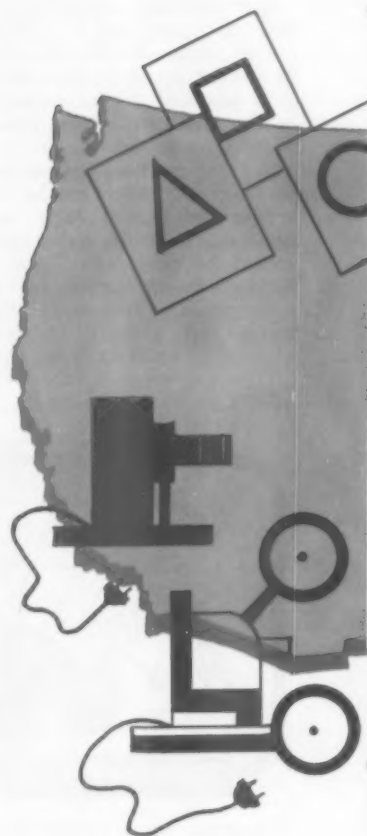
"Communication," to use the new term for methods of influencing the employee, uses a number of media which are also useful for messages other than safety.

One of the earliest of these was the bulletin board, and pictorial posters in great variety have been produced. Posters are still a widely used and effective medium but other audio-visual aids have been added to the safety man's sales kit.

The old stereopticon with its black-and-white glass slides has developed into the sound slidefilm with its sequences expertly staged and photographed in rich color and a silver-throated narrator to put across the message. Music for background and interludes is included.

Most ambitious of the media are motion pictures. Producing high grade talking pictures in technicolor is an expensive undertaking and few companies are able to make them. However, even a reel of amateur film with familiar faces and scenes has a strong appeal and can be used to supplement the professional pictures.

Fortunately, a large and growing number of both movies and sound slidefilms has been produced and are available on a loan, rental or purchase basis through several agencies.





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# Stonehouse

## SIGNS

### FOR INDUSTRIAL ACCIDENT PREVENTION

**DANGER**  
NO SMOKING  
MATCHES OR  
OPEN LIGHTS

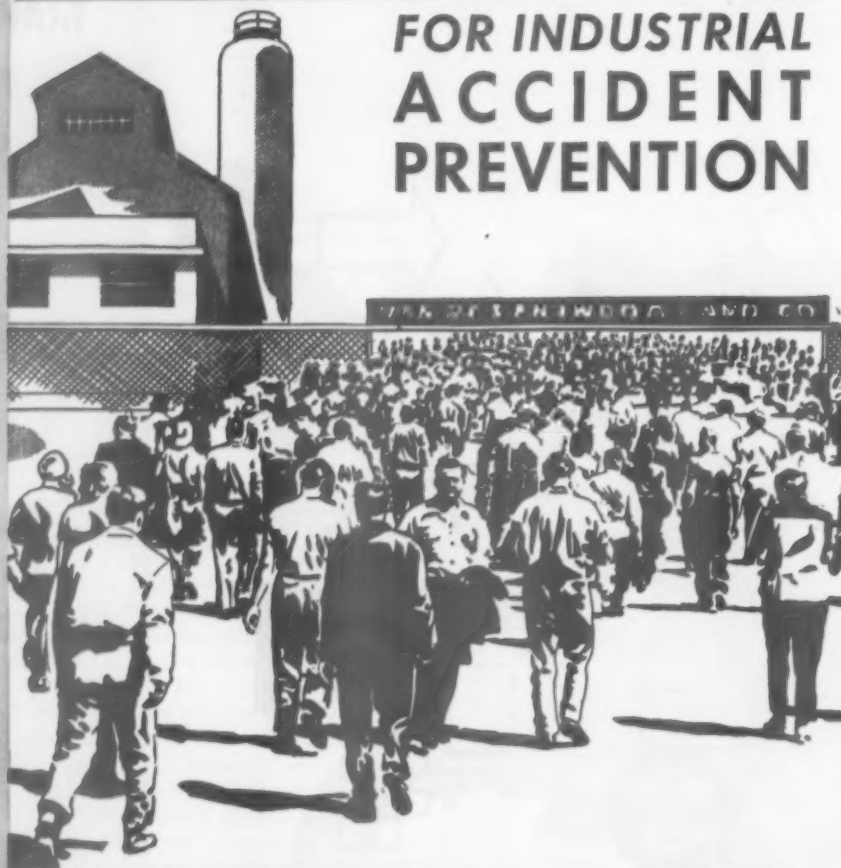
**THINK**  
THE BEST  
SAFETY DEVICE  
IS A CAREFUL WORKER  
GET THE SAFETY HABIT

**A FIRE**  
MIGHT PUT EVERY  
ONE OUT OF WORK  
HELP THE MANAGEMENT  
PROTECT YOUR JOB  
NO SMOKING

**NOTICE**  
KEEP THIS  
PASSAGEWAY  
CLEAR

**SAFETY  
FIRST**  
-WATCH-  
YOUR STEP

**CAUTION**  
- OPEN -  
SWITCHES  
- BEFORE -  
REPLACING FUSES



WHEN workers go through the gate, they should find safe working conditions inside. They should feel secure against possible accidents.

"Safe—they come to work: Safe—they go back home" is a fine goal for any Industrial plant.

### STONEHOUSE SIGNS

Train your workers in safe practices. Tell them; warn them of hazards and how to guard against them on the job. Do it effectively, economically—with Stonehouse Accident Prevention signs.

**Stonehouse**

"Signs Since 1863"

Our complete Catalog—64 pages, in full color—is yours, free on request.

**SIGNS, inc. MANUFACTURERS • Stonehouse Bldg., 9th at Larimer  
Denver 4, Colorado**



ACCIDENT PREVENTION • steel SIGNS IN STANDARD COLORS AND DESIGNS

# Training in Safety

**INSTRUCTION** in safe methods of work and development of sound attitudes toward the safety program have been made more effective through use of the many audio-visual aids that have been developed in recent years. These supplement and strengthen on-the-job instruction.

Safety is so closely associated with efficient operation that much of the instruction serves a double purpose.

The following aids are used extensively in training programs:

1. Employee manuals
2. Films—motion pictures and slides
3. Bulletin boards and posters
4. Easels and flipcharts
5. Employee publications
6. Instruction cards

**Employee manuals** are widely used in getting new employees acquainted with their jobs and keeping older employees reminded of company policies. These booklets tell the employee what the company expects of him and what he can expect of the company. Group insurance, medical service, personal service facilities, work and safety rules, and other details of employment are explained. There is a growing tendency to avoid the word "rules" in referring to job practices.

Manuals range from simple mimeographed booklets to elaborate illustrated books. Cartoons give a friendly, informal tone to instruction and make rules seem less forbidding.

**Films**, both motion picture and slide, are valuable for training classes and for meetings. Types of films include:

1. Strip films projecting individual frames, with the instructor adding the commentary.
2. Sound slidefilms using a similar strip, with disk or tape-recorded commentary.
3. Separate projection slides with either live voice or recordings.
4. Sound and silent movies.

Slidefilms can often be made from photographs taken on the job with amateur equipment. Modern color photography has added realism and attention value to both slides and movies, but black and white pictures are still useful for some subjects

which do not lend themselves well to color.

Movies require more expensive equipment and greater skill in their production but short amateur movies can fill a useful place in the program.

Most of the motion picture films, however, will have to be obtained from outside sources and a great variety of films are available on a rental basis. Many are available through the National Safety Council which issues an annual list of movies and slidefilms that can be supplied.

## Bulletin Boards

Bulletin boards in prominent locations are excellent media for official announcements and news as well as for safety information and reminders in the form of posters, charts, photographs and exhibits of protective equipment.

In a company which does not have an employee publication the bulletin board serves some of the functions of a newspaper.

Safety posters are the most visible evidences of accident prevention work. Unfortunately, some companies have depended on posters to carry the whole load and neglected such essential activities as guarding and job instruction. If the poster displays are not backed by sincere effort to eliminate physical hazards, employees will have little respect for the safety program.

The potential value of posters is emphasized by the efforts of advertisers to acquire billboard space near factory gates. These locations are frequently used for large safety signboards where both employees and the public can get the message. Outdoor boards are made more effective by floodlighting.

Bulletin boards inside the plant should be placed where employees can see them when they are momentarily at leisure, a favored location being near drinking fountains. They should be centered at eye level, about 63 inches from the floor. The board should be in a well-lighted place, specially lighted if possible.

A convenient size for a bulletin board is 22 inches wide by 30 inches high.

Boards should be attractively painted and glass covered. Green, the traditional safety color, is commonly used but there is no reason why other colors should not be used. One board at a location in the workroom is usually sufficient but in lunch rooms or locker rooms several panels may be used effectively.

Flashing lights attract attention and are sometimes used effectively in nonproducing areas. However, they may be objectionable in work places.

A bulletin board need not carry safety posters exclusively. Any subject of mutual interest to employees and management may legitimately use the boards. In fact, safety posters may have a stronger appeal if used for displays on other subjects.

No one poster does the job. It is



An eye-arresting display at a plant entrance. White paint, with illumination at night focus attention on the safety and news posters in the glassed-in board, the home-made poster on top, and the score of safe days for the plant shown below.



The plant cafeteria is a favored place for displaying motion pictures and slide films during lunch period. Programs combine instruction and entertainment. (Electromotive Div., GMC)

the impact of the whole program week after week. Different posters will appeal to different people and to different moods in the same person.

Ordinarily it is not necessary to spend too much effort in the selection of posters on a given subject. However, it may sometimes be desirable to launch a special campaign on some such theme as eye protection or the wearing of safety shoes.

Bulletin boards may be used for other purposes than displaying posters. Notices may inform employees about matters of local interest, such as comparative safety records and reports of accidents and near accidents.

Displays of broken goggles and damaged safety shoes and hard hats are interesting and convincing when

accompanied by stories and pictures of the workers involved. But even these object lessons can become monotonous and it takes ingenuity to find new ways of presenting them and new approaches to familiar subjects.

Some companies allow bulletin board displays to remain for a week but a better plan is to change it as often as every two days. There is plenty of interesting material available and the cost is low. Probably every one in the area has seen it several times in two days and a fresh display will attract more attention.

Posters, if carefully handled, can be rotated to three boards. They should be discarded when they show signs of wear. Bulletin board displays should maintain the high standards expected of advertisements of the company's products.

Posters bring eye-arresting splashes of color and safety messages to the bulletin board. Often the poster displays will catch the new employee's eye on the way to his department. These graphic displays will inform, remind and often amuse, since an occasional light touch has been found effective in getting across serious thoughts.

Jumbo posters, 8½ x 11 feet in size are often placed on boards in conspicuous locations where the employee cannot fail to see them when coming to work or leaving the plant. If they can be seen by the public passing the plant, they will also help to make a favorable impression.

Many companies obtain jumbo posters from the National Safety Council on a monthly service basis.

Some paint bill boards with original artwork, perhaps including the plant's score of accident-free days.

Easels and flipcharts are helpful in conducting meetings. Example of this type of material are the National Safety Council's *Safetygraphs*, each dealing with a specific safety topic designed for use by foremen and others in holding meetings with small groups.

Safetygraphs are collections of drawings, cartoons, charts and other illustrations printed on heavy paper and spiral-bound in a folder that opens to form an easel. With the large illustration facing the audience, the instructor discusses the subject portrayed, using his own words or reading the suggested talk on the back of the illustration facing the audience.

Safety instruction cards, covering safe methods of practically every type of industrial operation, as well as seasonal and off-the-job subjects, are issued to employees as part of their job instruction. Often they are placed near the bench or machine to serve as reminders of precautions to be observed on the job.

While the messages on most instruction cards are rather long to serve as posters, some companies make enlarged photostats of the cards and mount them on bulletin boards.

Employee publications furnish an excellent medium for the safety message. These publications range from simple mimeographed bulletins to elaborately printed and illustrated magazines. Illustrated safety stories are regular features in some publications. —To page 282



Displaying the score of safe days prominently has been found effective in maintaining employee interest. (Miller Brewing Co.)



A safety message in eight-inch red plastic letters attracts attention. Copy can be changed easily. (Wagner Sign Service, Inc.)



# Wausau Story

by **WALTER BELSON**

Assistant to the President, American Trucking Associations



Wausau's safety director Ralph Bettin (left) and Mr. Belson at a school crossing. As a special reward for safety performance, Officer Bettin takes 15 Wausau youngsters to the National Safety Patrol Assembly in Washington, D. C., each year.

## Employers Mutuals of Wausau are "good people to do business with."

As Mr. Belson points out—people *think* safety in Wausau. It's part of their way of living. It's also part of *our* way of doing business. Our specialty is **workmen's compensation**, and it's no coincidence that in writing this insurance we'd far rather *prevent an accident than pay for one*. We'd rather have you give a worker a pay check than a claim check.

For this purpose, Employers Mutuals

has developed an accident prevention program which includes dozens of special safety services. By cutting accidents we are able to cut insurance costs for our policyholders. A Wausau man can show you how. It could well be worth your while to phone the nearest of our 89 offices. Or write directly to Wausau, Wisconsin. Employers Mutuals handles all lines of fire and casualty insurance.

## Employers Mutuals of Wausau



**What is there about Wausau, Wisconsin, that makes it the ideal home for one of the world's most important insurance companies?**

**Employers Mutuals invited a transportation executive to visit its home town and find out.**

**WAUSAU** has kids like any other place. Wausau has its cars and trucks and people crossing streets and traffic problems just like any other active city.

And yet last year Wausau was voted the Safest City in America. Because of the work of our industry with safety, I was interested to know how Wausau accomplished its unusual record.



It starts with the Wausau kids. You see them at every school crossing, armed with their long safety flags and real authority. There's even a program for bicycle safety, and bike traffic laws with teeth. Violators attend safety lectures on Saturday morning. Sometimes bikes are impounded.

Every year the Junior Chamber of Commerce invites all Safety Patrol members to a picnic as a reward for their good work. The Parent-Teachers Association has similar parties.



To make sure that Wausau youngsters will learn to grow up on the right side of the road, Police Chief Everett Gleason has started such programs as a high-schooler's driving training course.

The Chief points out that it's not the police who made Wausau's safety record. It's the people of Wausau themselves. As he puts it, "Wausau *wants* to be safe—and it is!" That's a wonderful spirit. It's the spirit that helps explain why people in Wausau—and that includes Employers Mutuals—are good folks to know.

# SAFETY SIGNS

**EVERYWHERE** you go signs meet your eye. At work, on the highway and in public places, they warn you of hazards, announce rules and regulations, and give directions. Even an illiterate person can often get the message at a glance.

Signs stand out conspicuously against their surroundings because of shape, color, wording and location. Recognition of these elements in commanding attention has led to the adoption of standards that promote uniformity of design and color for signs that fall into various classifications.

Some signs immediately register their message because of their distinctive shape. Examples are the octagonal stop signs at highway intersections and the cross-buck signs at railroad crossings.

**Color.** According to American Standards Code Z35, Specifications for Accident Prevention Signs, characteristic colors for signs should be:

1. Danger—Red
2. Caution—Yellow
3. Safety Instruction—Green
4. Direction—Black
5. Information—Any combination of colors—except red and yellow

Commercial signs now available conform to the specifications of the Code. They cover a variety of messages for nearly every industrial situation, and special signs can be made to order. Enameled metal, the most frequently used material, is resistant to rust and corrosion and is easy to keep clean.

**Visibility** of warning signs is a first requisite. Special illumination may be necessary in poorly lighted areas.

Black on white and black on yellow are the most visible combinations. Other combinations are white on black; yellow on white; blue on white; white on blue.

Yellow is the most conspicuous color in daylight; red can be seen most readily by artificial light.

Red is universally accepted to

denote danger or fire apparatus. This should always be considered in choosing color combinations for danger signs. Color's force should not be weakened by indiscriminate use.

Color combinations that contrast with surrounding colors should be used so they will stand out clearly. Use only permanent colors.

**Location** is an important factor, and the effect of a warning sign is wasted if it cannot be seen easily or if it is too far from or too close to the point of danger.

**Wording** of signs should be brief, clear and understandable to persons with limited vocabulary.

Whenever the nature of the hazard may not be evident, the sign should if possible specify the danger, such as "Gasoline Storage."

The shorter the wording the better, but many people resent a brusque order, however impersonal it may be. The best sign will, if it expresses more than a mere stereotyped phrase, like *stop* or *slow*, invite cooperation rather than demand conformity.

**Lettering** should be as large as possible, consistent with balance and legibility. Block letters are recommended for ease in reading.

The weight of line in the body of each letter should be about the same as the space between the lines.

Tables of distances at which well proportioned letters can be read by persons of normal vision under good lighting conditions are given in the American Standards Code. This code also offers detailed specifications on sign construction of the standard types.

**Danger** signs should be restricted to such immediate and serious hazards as high-voltage equipment, toxic and corrosive chemicals, collision hazards, explosives, etc. Employees should be warned of their importance.

**Caution** signs warn employees against potential hazards, such as

improper use of elevators, cluttered aisles, and sparks from grinding wheels; or against unsafe practices such as oiling machinery in motion, smoking in forbidden areas, and operating machines with detached guards.

Workers should be trained to respond to a caution sign as an indication of potential danger requiring care and alertness. The difference between the **danger** sign and **caution** sign is one of degree.

Other general types include safety instruction signs, which designate certain actions or practices, directional signs, and information signs.

**Maintenance.** Periodic inspection and inventory of signs should be part of the safety program. Signs should receive the same cleaning and maintenance that is given to other equipment. Dirty

—To page 282



Examples of standard safety signs. Stock signs carry wording for almost every need.



**"It's all right...**  
*there's a telephone  
right here, too"*

The man who has a telephone at his elbow in the office appreciates the same convenience in his home.

He knows that running downstairs or from room to room to telephone is an unnecessary waste of time and energy . . . when additional telephones, conveniently placed, cost so little.

Great thing for Mother, too. For telephones in the kitchen and bedroom will save her many steps. And give her greater peace of mind, especially at night when she may be at home alone.

All of this convenience—and safety too—can be yours at small cost for each additional telephone. Just call the business office of your local Bell telephone company.

**Bell Telephone System**



SERVICE THAT'S WORTH SO MUCH...COSTS SO LITTLE



# Ready Made.

## SIGNS for SAFETY

## METAL SIGNS—

- Baked Paint Finish
- Porcelain Enamel Finish

to help you  
**SOLVE YOUR  
 ACCIDENT  
 PREVENTION  
 PROBLEMS**

**WRITE FOR CATALOG!**

# READY MADE SIGN Co., Inc.

115-117 WORTH STREET • NEW YORK 13, N. Y.

### **SPECIAL SIGNS MADE TO ORDER**

## PLAQUES, TROPHIES, AWARDS

*for all industrial competition*

Incentives that will make your safety program work better!—Skillfully carved walnut plaques offer an award that stimulates enthusiastic competition . . . at prices that fit within your safety budget.

**FREE CATALOGUE ON REQUEST.**

**Write for yours today.**

## DESIGNS AND QUOTATIONS

submitted without charge. Let us hear of your program.



Dept. N83

17 SOUTH WABASH CHICAGO 3 ILLINOIS

## Safety Signs

—From page 280

and disfigured signs are not convincing.

Signs which are no longer needed should be removed. Where hazards have changed, signs more appropriate to present conditions should be substituted.

**Warning tags** come in a variety of stock subjects. They are attached to equipment in emergencies to warn others that men are working on machines, that a valve on a pipe line has been shut because of a leak, etc. They are also used on unsafe equipment which is to be removed from service.

**Decals** are miniature signs which can be attached permanently to machines, walls or other places where a message of warning, caution or brief instruction is needed. They conform to the standard specifications of design and color.

**Signboards** with changeable letters are available in small size suitable for departmental use and larger types which may be erected in conspicuous places near the plant entrance where they can be seen by both employees and the public.

These boards may be used for brief safety messages and for recording the plant's record of no-accident days.

### Safety Incentives

Group and individual awards for safety accomplishments have been widely used. For plants and departments, plaques, trophies and banners are often presented. For individuals, automatic pencils, wallets, key rings and lapel buttons are among the popular items.

These awards are available in a variety of stock designs. Distinctive ones can be made to order.

## Training in Safety

—From page 278

Most publications carry news of employee and company activities but some are strictly safety bulletins for employees, supervisors, and special groups.



## Publications

The National Safety Council's *Accident Prevention Manual for Industrial Operations* which heads the bibliography for practically every section in this issue, is an illustrated, cloth-bound volume of more than 800 pages. It contains the essentials of a complete program of accident prevention and occupational hygiene.

Each major section of the *Manual* is available as a separate paper-bound reprint. These 26 pamphlets are intended for wider distribution of specialized material. They replace many of the older Safe Practices Pamphlets which have been discontinued.

Sections of the *Manual* are reprinted in the following booklets.

1. Permanent Structure and Plant Layout
2. Maintenance and Maintenance Crews
3. Boilers
4. Pressure Vessels
5. Refrigerating Equipment
6. Principles of Guarding and Transmission Guards
7. Power Presses
8. Metalworking Machinery and Abrasive wheels
9. Woodworking Machinery
10. Guarding Special Equipment

11. Storage and Manual Handling of Material
12. Power Handling of Material
13. Hand and Portable Power Tools
14. Welding and Cutting
15. Electrical Hazards
16. Flammable Liquids
17. Fire Prevention
18. Fire Extinguishment and Control
19. Personal Protective Equipment
20. Motor Transportation
21. Industrial Health Engineering
22. Industrial Poisons

23. Medical Services and Table of Chemical Hazards
24. Safety Organization and Training
25. Accident Records
26. The Safety Man's Resources

NATIONAL SAFETY NEWS brings each month 100 or more pages of practical material on industrial accident prevention, occupational hygiene, fire protection, as well as news about people, products and events in the field.

—Turn page

## GRAPHIC FACTS

are dramatic facts



And you can make graphs yourself quickly, easily and save the cost of the Kit with your first chart . . . without ever touching a pen!

Translating information into chart form is the best way to tell your story quickly and dramatically and NOW—with Chart-Pak—everything you need is printed on rolls of tape! You roll on dotted lines, bars, figures, dates. You can't make a costly error—it can be taken up as quickly as it is put down. The average charting time is minutes—the cost—far less than other methods. And you or your secretary can do it.



A complete kit with twenty-eight 300" rolls of many patterns and colors is only \$34.50.

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Please send me Chart-Pak method data on:

☐ Graphic Charts ☐ Organization ☐ Office Layout

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

FOR BOTH KINDS  
OF SLIDEFILM!

**AUTOMATIC:**

A 30-50 CYCLE INAUDIBLE  
SIGNAL ON THE RECORD  
AUTOMATICALLY ADVANCES  
THE FILM IN COMPLETE  
SYNCHRONIZATION WITH  
THE RECORD . . . and **MANUAL:**

THE PRESENT TYPE OPERATES MANUALLY FROM  
AN AUDIBLE SIGNAL ON THE RECORD.

FILL IN • TEAR OFF •  
MAIL COUPON NOW!

Send FOR  
FREE FOLDER  
TODAY!

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DUKANE CORPORATION

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☐ Please send FREE Descriptive Folder on  
30-50 AUTOMATIC SOUND SLIDEFILM PROJECTORS.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_



Model 14A290  
also operates  
with L/P records.

*Sectional News Letters* deal more specifically with the problems and news related to the industries they serve.

*Accident Facts* presents the annual roundup of accident experience throughout the country, giving summaries, analyses, rates, charts and tables.

*The Safe Worker*, a monthly pocket-sized publication for employees, has a wide circulation throughout industry. Written and illustrated in a gently humorous vein, it covers general safety themes.

For the transportation fields there are similar publications called *The*

*Safe Driver* and *The Safe Railroader*. For construction workers, *The Safe Builder* was recently introduced.

Numerous miscellaneous booklets published by the National Safety Council cover health and off-the-job subjects and are designed specifically for the worker.

*The Industrial Supervisor* each month provides help for the foreman in meeting his safety and training problems, offering articles and features on technical and human relations subjects, safety talks, how-to-do-it features and the like.

Other publications for foremen include a series of 12 pamphlets on

*Safety in Foremanship*, six pamphlets on *Psychology of Safety in Supervision*, and volumes of suggested five-minute talks for the foreman to use "as is" or as the pattern for his own version of each subject.

*Data Sheets* offer concise, authoritative discussions on specific safety subjects. They, like the pamphlets, are furnished separately or as full sets in ring binders.

*Detail Sheets* offer working drawings for construction of temporary structures or safety devices that any workman can follow.

Special releases include *Accident Facts Memos*, *Engineering Studies* and *Safety Reprints* covering a wide range of subjects.

*Safety score charts*, home-made or available in poster services, bolster pride in the plant no-accident record, or remind employees of the accident record.

*Photocopies* are give-away booklets for the workers—to teach safety with pictures. Actual on-the-scene photos make these training aids realistic and convincing.

*The Trade Press*. Periodicals serving the various branches of industry at the management level are carrying an increasing amount of engineering and organization data on various subjects relating to accident prevention and occupational hygiene.

**Other sources of help.** Invaluable assistance in the promotion of safety

# BAKED ENAMEL or porcelain enamel SAFETY AND TRAFFIC SIGNS

EMBOSSSED  
BAKED ENAMEL  
POINT OF PURCHASE  
DISPLAYS  
& PLAQUES  
BLACKBOARDS  
CHANGEABLE LETTER  
BULLETIN BOARDS  
DAILY DATE WALL  
CALENDARS



**MOORE SIGNS, INC.**

**10987 Gratiot Ave.  
Detroit 13, Michigan**

PROMPT SERVICE ON SPECIAL COPY SIGNS

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Directory of Safety Posters.

National Directory of Safety Films.

How to Prepare a Safety Manual—Safety Reprint Gen. 30.

### National Safety News

Good Medicine for Any Plant—D. H. Tilson, Feb. 1953.

More Power to Your Words (Photography)—Norval Burch, Feb. 1953.

Color Slides Hold Their Interest—Norman Howlen, July 1952.

The Education of a Safety Man—Glenn Griffin, Jan. 1952.

Lines of Communication—Robert Clair, Jan. 1952.

Visual Aids Section—June 1954.

Take a Camera with You—A. B. Hofstetzer, July 1954.

in industry is being rendered by numerous organizations. These groups and their specialized activities are described in Section 26 of the *Accident Prevention Manual for Industrial Operations*, available as a separate pamphlet entitled *The Safety Man's Resources*.

Types of organizations described are:

Standards and Specifications groups, such as the American Society for Testing Materials, American Standards Association, Associated Factory Mutual Insurance Companies, Factory Insurance Association, National Board of Fire Underwriters, National Fire Protection Association, and Underwriters Laboratories.

Service Organizations—including Industrial Hygiene Foundation and National Society for the Prevention of Blindness.

Federal agencies—U. S. Department of Labor, U. S. Public Health Service, Bureau of Mines.

Insurance associations.

Trade associations.

Insurance services.

Professional societies.

## Sell Safety—ON THE JOB!



*Admatic Portable—16 Projector. Screen size 11" x 15". Holds 16 slides. Weighs 47 lbs. Two other console models with larger screens, more slide capacity available.*

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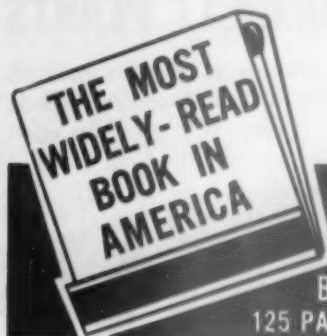


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## Audio-Visual Aids For Effective Meetings

AUDIO-VISUAL AIDS can be used effectively to motivate and supplement instruction. They should be chosen to fit in with the method of instruction to be used, the group to be instructed, and the objectives to be achieved.

Audio-visual aids should serve to:

1. Formulate correct ideas.
2. Create interest.
3. Intensify impressions.
4. Broaden experience.
5. Save learning time.

No matter how good an aid may be, its effectiveness will be determined largely by the way it is used. Audio-visual aids have the advantage of being easily understood even by poor readers.

It should be remembered that audio-visual aids are not a complete program in themselves. Here are some suggestions for their use:

1. The user must know his subject and be thoroughly familiar with the aids.
2. The material must be introduced properly. Tell the audience what to expect and its significance.
3. Avoid distractions, such as noise, improper focus, etc.
4. Don't use too many devices.
5. Plan the sequence.
6. Try for exact timing and smooth handling.
7. Be sure material is pertinent, and clearly displayed.

Audio-visual aids may be rented or purchased. Some may be made to order by an outside agency or within the plant. Home-made aids range in price from a few dollars to several thousand.

Following are some of the aids used.

1. Charts—from 8½ x 11 inches to 30 x 40 inches.
2. Models, mock-ups, demonstrations.
3. Sandpaper board.
4. Movies.
5. Slide films.
6. Recorders—wire and tape, sound-scriber.

### The Meeting Room

Good ventilation, as well as an interesting program, is needed to keep the audience awake. The room should be large enough to accommodate the audience comfortably and have good acoustics. It should be possible to hear the speaker from the rear row.

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## Green Cross News

—From page 14

Drivers' License Division of the State Department of Motor Vehicles, and Walter C. Lunsford, manager of the Fresno County Safety Council, are working with the Association. The license holder will identify the driver as a diabetic in case of injury in a motor vehicle accident. Often, in the shock following an automobile crash, a perfectly sober diabetic victim appears to be under the influence of alcohol.

## Pittsburgh Industrial Report

In the annual report of the Industrial Division of the Western Pennsylvania Safety Council, Vice President H. B. Duffus said the work of the Division for 1954 was expanded and intensified generally. Films were shown 844 times before audiences of 168,867 workers; safety exhibits were seen by 10,000 persons; the annual conference registration totalled 2,352 delegates from 413 member companies. A specialized training course featured "A Practical Research Approach to Accident Prevention."

A River Transportation Exchange group was formed; a small plant safety campaign was carried on; 16 inserts were added to the Council's Standard Safety Procedures and a Data Sheet was written for the National Safety Council on *Aluminum and Alloys*. Another high spot was the Management's Accident Prevention Training Course. All in all, 1954 was just about the busiest and best year yet for the Western Pennsylvania Safety Council.

## Fort Wayne Films

The Safety Council of the Chamber of Commerce of Fort Wayne has recently published in pamphlet form a list of available films that may be obtained from that organization "for safety education within business and industry, on the farm, in homes and on the streets and highways."

Manager Ivan Martin has listed and discussed briefly 71 films available through his library, covering traffic, home, farm, industrial, health, fire prevention and general safety. This visual service is appreciated by council members, participants in the industrial and traffic fields.

A race track is the only place to find windows that clean people.

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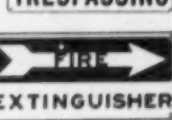
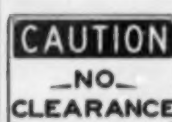


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# THE SAFETY LIBRARY

Books, Pamphlets and Periodicals of Interest  
to Safety Men



Compiled by Ruth Parks, Librarian, NSC

## BOOKS AND PAMPHLETS

### Construction Industry

*125 Ways to Better Power Shovel-Crane Operations.* Power Crane and Shovel Association, 74 Trinity Place, New York 6. 1954, 31p. Free.

### Electrical Industry

*Specifications for Electrical Workers Insulating Safety Headgear.* Edison Electric Institute, 420 Lexington Ave., New York 17. 1954, 7p.

### First Aid

*First Aid Guide.* U. S. Forest Service, 1954, 57p. 20c. For sale by the Superintendent of Documents, Washington 25, D. C.

### Mines

*Coal-Mine Hazards from Overlying Gasoline Pipelines: Description of Gasoline Explosions in Two Pennsylvania Bituminous Coal Mines.* U. S. Bureau of Mines, 1954, 15p. Information circular 7708. Free. Available from the Bureau, Publications Section, 4800 Forbes St., Pittsburgh 13, Pa.

### Printing Industry

*Safety Code for Control and Signaling Devices for Graphic Arts Presses.* American Standards Association, 70 East 45th St., New York 17. 1954, 10 p. ASA B65.1-1954. 50c.

### Standards

*Standards for a Strong America. Proceedings of the Fifth National Conference on Standards and the Thirty-Sixth Annual Meeting of the American Standards Association,* 70 East 45th St., New York 17. 1954, 97p. \$3.00.

### Woodworking Industry

*Safety Code for Woodworking Machinery.* American Standards Association, 70 East 45th St., New York 17. Revision 1954, 23p. ASA-O1.1-1954. \$1.00.

## MAGAZINE ARTICLES

### Aeronautics

*How to Design for Crash Survival.* Aviation Week, January 17, 1955, p. 21.

### Electricity

*Can 110 Volts Kill?* By Karl S. Geiges. Factory Management and Maintenance, January 1955, p. 138.

### Fire Protection

*Fire Extinguishment Research.* By J. E. Malcolm. Fire Engineering, January 1955, p. 33.

*New York Finds Inspections by Fire Companies Effective.* Fire Engineering, January 1955, p. 28.

### Health

*Aspects of Occupational Dermatoses.* By Joseph V. Klauder and Frank C. Combes. Industrial Medicine and Surgery, January 1955, p. 13.

*Manganese Poisoning. The 1954 Ramazzini Oration.* By Rafael Pen-alver. Industrial Medicine and Surgery, January 1955, p. 1.

*Plant Preventive Medicine Pays.* By E. P. Luongo. Industrial Medicine and Surgery, January 1955, p. 8.

*Standards for Safeguarding the Health of Industrial Workers.* By Herbert E. Stokinger. Public Health Reports, January 1955, p. 1.

*Toxicity Study of a Grain Fumigant (Dowfume EB-5).* By V. K. Rowe and others. Agricultural and Food Chemistry, December 22, 1954, p. 1318.

### Noise

*Fundamentals of Noise Control.* By Adone C. Pietrasanta. Noise Control, January 1955, p. 10.

*Legal Aspects of Noise.* By Noel S. Symons. Noise Control, January 1955, p. 72.

*How Quiet Must It Be to Measure Normal Hearing?* By Jerome R. Cox, Jr. Noise Control, January 1955, p. 25.

*Measurement Techniques for Special Noise Problems.* By G. L. Bonvallet and S. M. Potter. Noise Control, January 1955, p. 46.

*Noise Reduction of Machinery and Vehicles.* By R. O. Fehr and R. J. Wells. Noise Control, January 1955, p. 30.

### Railroads

*ACL Crossing Hazards Reduced by Using Reflective Letters.* Railway Age, January 17, 1955. p. 22.

### Shipbuilding

*Accident Prevention in Shipyards.* By James J. Avellone. Supervision, January 1955, p. 21.

### Trucks

*Mirrors Prevent Accidents.* By Homer Steiner. California Safety News, December 1954, p. 5.

### Workmen's Compensation

*The Place of the Second Injury Found in the Employment of Physically Handicapped Persons.* By Warren C. Tucker. The Monitor (Associated Industries of the State of New York), December 1954, p. 2.

## New York to Hold 25th Safety Convention

New York's 25th annual Safety Convention and Exposition will be held in the Hotel Statler April 11-15 under the sponsorship of the Greater New York Safety Council and 71 co-operating agencies. Among these are the Army, Navy, Atomic Energy Commission, Red Cross, the City administration, and business, civic, government and professional groups.

There will be 58 meetings, covering almost all fields of traffic, home, industrial, school and public safety. There will be more than 200 addresses by Federal officials, scientists, local enforcement officials, safety engineers, educators and industrial executives. An attendance of 11,000 is expected.

In observance of the Silver Anniversary safety convention, this City will officially observe "Greater Safety Week" in welcome to the accident prevention workers and to emphasize individual responsibility in avoiding accidents.

In conjunction with the convention the Safety Council will hold an exposition of the latest developments in safety devices, demonstrations of psychophysical tests for motorists and other aids to accident reduction. There will be 150 displays, topping the previous record of 118.





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OFF THE  
PRESS!**

**W**ANT to get folks talking and thinking about highway safety? Then just hand them a copy of Highway Zoo. The Council's new 4-color booklet is a conversation piece. Ideally suited for use in off-the-job accident prevention programs, it will give zip to your safety efforts. And it is one book you can use as a souvenir item at your Safety Award Banquet, safety conference, etc. Many firms will use them in 1955 as mailing pieces. It will fit your program to a "T."

Prices: Single copy free; 2 to 9 copies, 10 cents each; 10 to 99, 7 cents; 100 to 999, 5 cents; 1,000 to 4,999, 4 cents; lower prices in larger quantities.

**NATIONAL SAFETY COUNCIL**

**425 North Michigan Avenue • Chicago 11, Illinois**

# The Case for the Insurance Safety Engineer

By WILLIAM F. CHAPMAN

**A**T ONE TIME or another all businessmen, large or small, come in contact with the representative of their insurance carrier whose card may announce him as "inspector," "safety engineer," "conservationist," or any other title indicating the fact he represents that division in his company which is pledged to saving lives, property and money.

All too often the recipient of the card will assume the attitude that the saving of money is the one and only objective of his caller and then, only when the money saved is that of the insurance company. He feels that the rates he is paying is taxation enough without the extra burden of taking time out to escort some nosy troublemaker on a Cook's Tour of his place of business.

That's fine for mines, ammunition manufacturers, big power press operations and bridge builders, but how many shops have operations as free from hazards as this one? What can go wrong in this business anyway? We haven't had an accident in this shop in 15 years. Can't he get his information from the agent who handles our insurance? Can't he check the previous carrier and see that this is a decent shop?

Many of the above questions are not confined to the mind of the businessman. Frequently they are put directly to the insurance safety engineer. It is paralyzing proof that safety is still a minor consideration in industry. The efforts of state and national organizations, in spite of their great forward strides, have, like the mustard seed in the parable, fallen on stones or among the weeds and never come to fruition. Constant seeding, through constant teaching and constant reminding, may eventually be rewarded with conquered or converted ground. But what of the "stones" in the field? Only plowing and diligent cultivation can reclaim or give birth to this section.

By their numbers, by the laws that make compensation coverage mandatory and by reason of the fact that the insurance safety engi-

neers are the first actually practicing safety to contact many of our businessmen, the job of plowing and cultivating falls to these men.

Not all of the "stones" are found in little business, either. Large concerns often present problems of the same nature, though for entirely different reasons. With all kinds of professional engineers on the payroll or at their disposal, they feel little need for someone who, to their way of thinking, is not a production man.

Recommendations made by a safety man for materials handling equipment, personal protective clothing, stockpiling methods, guards and safety meetings represent only an expense on the ledger. They feel that machines designed for them or by them have had all safety features incorporated in them. So what is left for the safety engineer to do?

They fail to realize that the majority of safeguards which they accept as standard today were developed by persons other than the machine inventor. The various types of press guards, micro-switches, interlocks, exhaust systems and protective clothing are the result of combined thoughts, experiences and sufferings of people who have been exposed to machines or operations originally thought adequately safeguarded. Such standard items as meat grinders, bread slicers, doughmixers, bottling machines and hundreds of others have been using the same approved type guards for years, yet every day each of these machines takes its toll in fingers, arms and eyes.

## Trained Minds Needed

In view of the tremendous scientific gains made since World War II, is it fair or reasonable to assume that nothing further be done to improve the safety features incorporated in our machines? The varied applications of guarding to any one machine indicates the many different avenues of approach to any given problem.

Machine design, electronics, chemistry—indeed, any form of engineering—calls for a trained mind. Per-

sonnel men must be trained in psychology and sociology; industrial engineers, a far-reaching field spawned by the "efficiency experts" of some years ago, have changed many concepts previously adhered to. The pace of industry has been increased tremendously in the past decade and the resulting change in economy has effected all businesses in the methods of operation.

These changes in pace and in operations make it imperative that the safety engineer's work be recognized as a distinct and separate function. Proof has been set forth showing that safety has a direct influence upon production. In those instances where it has been fairly tried it has never yet lost a battle to the bug-a-boo, "cost." It has, in fact, effected savings in excess of its cost and this, without the individual thanks of those whose arms and legs were saved, where savings cannot show in dollars and cents.

## Sweat Shops Still with Us

America's largest industries have tried it and found that it is a paying proposition. Some of America's intermediate industries have tried it and found it is a paying proposition. And now, after years of crying at the door of all industry, the idea is taking hold, to some extent, and small industry is finding it a paying proposition. By and large, however, the majority of employers must still be reached—the era of the sweat shop has not been completely eradicated.

The idea of greater production through safer working conditions has not been accepted by a large segment of the producers of materials contributing to the American way of life. The feeling is passed on from employer to foreman, from foreman to worker and the worker goes on maiming and killing. The vicious cycle continues and the employer goes on paying increased insurance rates and castigating the insurance carriers.

The foreman gets the idea, passes it on to the worker, and all have the impression that the carrier is the

—To page 294

William F. Chapman is Field Engineer, Zurich-American Insurance Companies, Chicago.

# **three new FIRST AID SAFETYGRAPHS**

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**2**

**FIRST AID TREATMENT  
FOR BURNS**

**3**

**HOW TO CONTROL  
BLEEDING**

Prepared in collaboration with the Council on Industrial Health of the American Medical Association.

Preview them at the Council display during the National Safety Congress—Lower Lobby, Conrad Hilton Hotel.

**NATIONAL SAFETY COUNCIL**

## Section 11—Safety Promotion and Training

—From page 292

only one making money—at their expense. The net result is that the man who presents his card to the receptionist is received with animosity, rebuke, stoicism and questioning.

The attitude of many of today's employers is expressed in the many different ways they have of asking the same question. It may be direct; it may be the facial expression; it may be the brush-off; it may be an out-and-out resentment of the carrier's stated prerogative that they can make such an inspection. In whatever form, it is undoubtedly, and inexcusably, the incompleted thought and action of someone who has not analyzed the safety factor.

It would be foolhardy to deny that the insurance carrier is interested in saving or making money. This is the first principle of any business. The greater the margin of profit, the greater the chance of success. And greater the chance of success, the greater a company can grow. The greater it can grow, the more people it can satisfy. And the more people it can satisfy—or gratify—the better will be the national economy. No one needs to expound the theory from that point on.

With a better economy the nation can only continue to progress. If progress is the aim of business and anything can be done to further that aim, why stop at the critical point—the safety of the persons who create that progress? What does it matter whether the critical point is indicated by one of your own organization or by a so-called outsider? The net result is the same—better, safer, cheaper products. The insurance safety engineer is interested in far more than the margin of profit for his own company; he is, as stated, interested not only in the preservation of life, limb and property, but also in the economy of all industry.

After all, if the economy of the nation is to profit, can't he, himself, live a safer, more profitable life through safety?

### Protection Against Wind

No section of the country is immune to damage from windstorms, nor is the menace limited to any season. Tornadoes, cyclones and hurricanes are more frequent in the milder months while destructive blizzards cause heavy damage in the northern sections during winter.

Roof coverings, copings and flashings are especially vulnerable to

wind damage. In addition, outside structures such as stacks, ventilators, canopies, signs and cranes should be designed and anchored to resist wind, and good maintenance should be provided.

Wood and steel-deck roofs need special anchorage to resist lifting by strong winds. Standard roof anchorage is designed to resist gust velocities of 90 mph. In most cases this will protect against minor tornadic storms and reduce the extent of damage outside the vortex of a severe tornado.

The vortex of a tornado rarely strikes a plant but there are many storms severe enough to tear off outside structures and plank-on-timber of joisted roofs that are not anchored on. Such forces are encountered in severe gales and thunder squalls as well as in minor tornadoes and in zones on the edges of the vortex of a major tornado.

### Protecting Vital Records

A business needs records to stay in business. It doesn't take much of a fire to destroy those records.

The threat of bombs has directed attention to the safekeeping of records. Many companies have had their records microfilmed and copies stored in a safe location. Microfilm storage needs good protection as it is even more susceptible to fire damage than paper. Heat warps and shrinks the film so that it cannot be run through a projector.

Many dispersed locations have been suggested for storage of record duplicates. A salt company suggests the use of its worked-out mines for safekeeping of securities and vital documents that must be preserved as originals. The Germans hid art treasures in such mines during World War II.

Records needed frequently can't be stored at such remote locations. They must be protected against the ever present menace of fire.

Records may be divided into four classes:

1. Vital—reproduction would be costly or would not have the same value as the original.
2. Important.
3. Useful.
4. Non-essential.

The first two need special protection.

Vital records should be kept in a vault or safe that would preserve them even if the building should be completely destroyed.

Important records may be kept in

the same vault as the vital records if space is available. If not, a fire-resistant storage room in a fire-resistant building should be provided.

Vaults or record storage rooms will not need an automatic extinguishing system if cabinets and shelving are non-combustible. A fire-detecting and alarm system is desirable. If combustible material other than records cannot be eliminated, automatic sprinklers or a carbon dioxide flooding system should be provided.

A vault independent of the building structure will stand even if the building burns and collapses. A basement location should be avoided because hot debris may "cook" the contents. There is also danger of damage by flooding.

Vault doors, safes and file cabinets are rated as to how long they will protect their contents against fire. Rates are determined by standard fire tests and range from ½ to 6 hours.

### Health Conference to Meet in Buffalo

Methods of safeguarding workers' health will be the primary subject for discussion at the forthcoming meeting of the American Industrial Hygiene Association in Buffalo April 25-28. More than 60 papers will be presented, together with panel discussions, committee meetings and joint meetings with other organizations active in the field of industrial health.

This meeting of the American Industrial Hygiene Association will be concurrent with meetings of the American Conference of Governmental Industrial Hygienists, American Association of Industrial Nurses, Industrial Medical Association, and the American Association of Industrial Dentists.

Experts in various fields will discuss health aspects of new materials of commercial importance, laboratory experiments, air pollution, and radiation. Workers from industry, governmental agencies, and universities will participate.

Exhibits and demonstrations will be arranged by companies producing equipment useful in the field of industrial hygiene and toxicology.

To keep a house running in this electrical age, just keep plugging.

When father's asked to shell out, the children expect more than peanuts.





# WHAT'S NEW

IN

NATIONAL SAFETY COUNCIL SERVICES \*

## First Aid Teaching Helps

Three safetygraphs on first aid are now available from the Council.

"How to Control Bleeding" illustrates the latest techniques in the field, including new research by the Committee of Medicine of the National Research Council.

"First Aid Treatment for Burns" discusses what to do for burns, frostbite, radiation and electric burns, as well as chemical burns of the skin and eye.

"Transportation of Injured Persons" covers examinations of injured persons to determine spine or neck injuries, and use of common industrial equipment to transport injured persons.

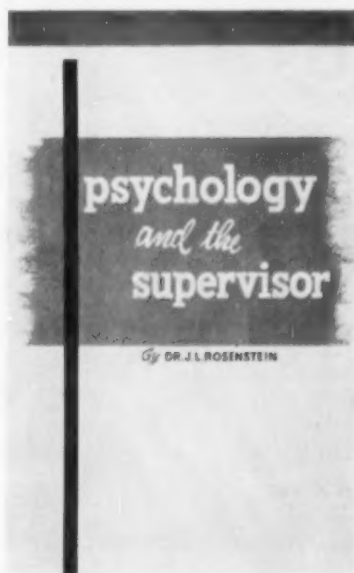
The safetygraphs provide a ready means of training small groups. Consisting of 12 spiral-bound pages, 18 x 24 inches, inserted in a brown leatherette portfolio, the safetygraph can be set on any flat surface and opened to form an easel.

On the pages facing the audience are large, clear drawings. On the back pages in easy-to-read type are notes for instructors.

## Psychology and the Supervisor

Those who have been stimulated and aided in their safety work through the talks of Dr. J. L. Rosenstein will want the collection of his writings which appeared in serial form in the *Industrial Supervisor* magazine. These articles have been assembled in a booklet entitled, *Psychology and the Supervisor*.

Dr. Rosenstein is a long-time favorite with safety men, having twice addressed the early morning sessions of the National Safety Congress. In addition he has worked with the Council on numerous films and articles, and has been a frequent contributor to *NATIONAL SAFETY NEWS*.



Among the subjects covered in the booklet are intelligence, self-esteem, personality, worry, fear, inferiority complex and heredity.

*Psychology and the Supervisor* is a 32-page booklet bound in heavy paper stock. It is priced to members at 60 cents per copy. Quantity prices are considerably lower.

## Marine Boiler Safety

A *Safety Manual for Marine Oil-Fired Watertube Boilers* is now available from the National Safety Council.

The manual is designed to help reduce accidents causing injury to personnel, destruction to property and detention of vessels for extensive repair.

Prepared by a committee of experts under the chairmanship of Arthur R. Gatewood, chief engi-

neer, American Bureau of Shipping, the manual covers in detail general operation, maintenance and repair from the time boilers are placed in service until they are laid up. General operation subjects are included such as automatic combustion controls, feedwater level control, port operation and securing, fires in boiler rooms and boiler room casualties. Some of the subjects covered in the maintenance and repair portion of the book are boiler water treatment, economizers, air heaters, casing and brickwork, and safety valves.

The 72-page manual, printed on durable stock with heavy paper covers, is amply illustrated. It is priced at \$1.50 to Council members and double to non-members. For further information and quantity prices, write the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

## Let Sammy Do It!

Have you made use of Sammy Safety, the Green Cross Kid, to help put across your safety program? Sammy has a way of drawing attention to your accident prevention message.



Why not use him to—

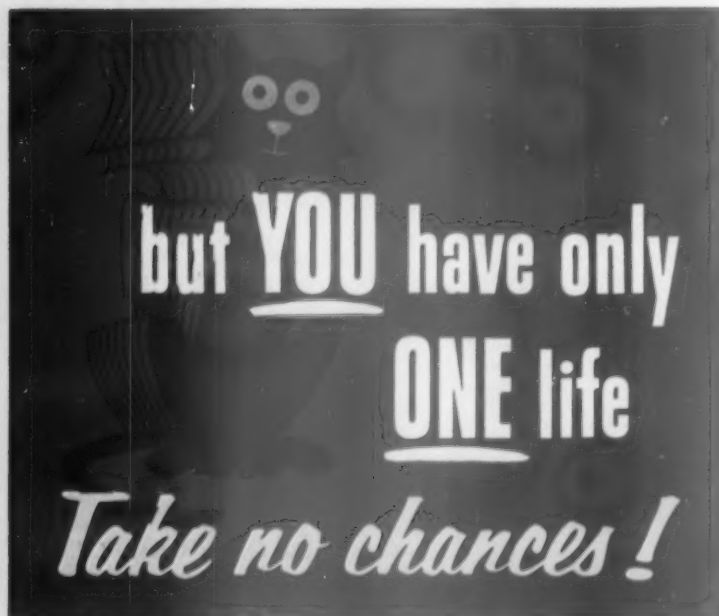
- Point to the bulletin board.
- Dress up an exhibit.
- Hold a safety slogan.
- Hold goggles that have saved an eye.

Sammy comes in a variety of models from 9 to 24 inches high. Write for details.



Look to this page each month for latest news about NSC services. Address requests for additional information, samples or prices to the Membership Department.

# For a More Successful Poster Program



JUMBO POSTER FOR MAY, 1955

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stacked. Its actual size is 9' 11" by 11' 8".

## SAFETY BANNER FOR MAY, 1955.

Here is the attention-getting, monthly cloth banner. Available in two types—indoor and outdoor—both are identical in size (10 feet long by 40 inches high), have the same general message and multi-colored design. Indoor type is of sturdy drill with grommets for easy hanging, while the outdoor banner is of extra heavy drill, with wind vents, and has strong stitched-in rope for durability.

**P**OSTER program aids miniaturized on this and the following pages are **NEW** — shown here for the first time. Those illustrated in one color on the following two pages are actually printed in two or more colors.

For maximum variety, refer to the 1955 Directory of Occupational Safety Posters. There you'll find 744 top-notch selections on a great variety of subjects. Additional copies of the directory are 50 cents each—write Membership Service, N.S.C.



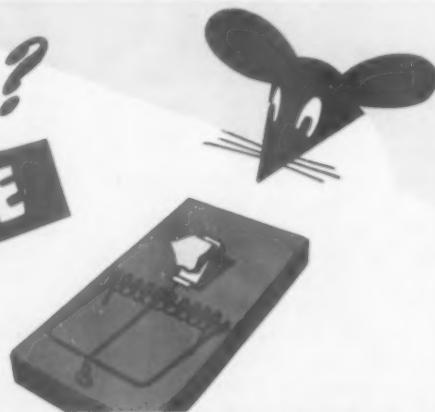
NATIONAL SAFETY COUNCIL  
V-0408-A 8½x11½

This new four color poster is illustrative of the 72 four color posters shown in the 1955 Poster Directory.

*why take chances?*

**SO LITTLE TO GAIN**

**SO MUCH TO LOSE**



Posters below are printed in two or more colors  
(Available only in sizes indicated)

**SMART TALK  
FROM THE  
SAFETY ZOO**



*Now, Mac-You call that  
GOOD Housekeeping?*

NATIONAL SAFETY COUNCIL

0421-C 25x38

*in a split second*



**NOT ALERT  
—BADLY HURT!**

NATIONAL SAFETY COUNCIL

0370-A 8½x11½

**IF  
YOU  
FIND  
THIS IS  
EASY TO  
READ YOUR  
EYES ARE OK**

PROTECT THEM

NATIONAL SAFETY COUNCIL

0190-A 8½x11½

*Get  
help*

*when the load's  
too heavy!*

NATIONAL SAFETY COUNCIL

0337-B 17x23

**OLD  
STUFF**



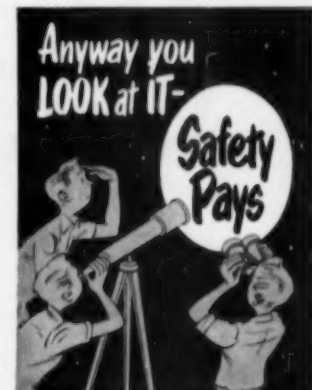
*"Some nitwits just never put  
things where they belong!"*

NATIONAL SAFETY COUNCIL

0349-A 8½x11½

*Anyway you  
LOOK at IT—*

**Safety  
Pays**



NATIONAL SAFETY COUNCIL

0372-B 17x23

**THERE'S SAFETY  
IN GOOD PILING!**



NATIONAL SAFETY COUNCIL

0377-A 8½x11½

**the RIGHT tool  
is SAFER!**

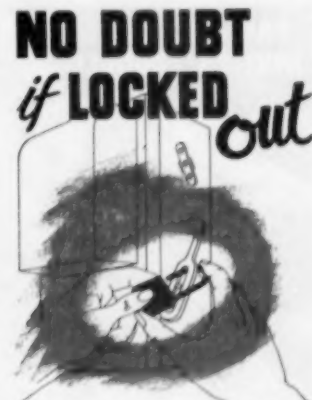


**ALWAYS USE THE SLEDGE  
on chisels, clawbar  
punches or drift pins  
*Never use the spike man!***

NATIONAL SAFETY COUNCIL

0405-B 17x23

**NO DOUBT  
if LOCKED out**



NATIONAL SAFETY COUNCIL

0329-B 17x23

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

Posters below are printed in two or more colors  
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0396-A 8½x11½



0393-A 8½x11½



0402-A 8½x11½



0355-B 17x23



0284-A 8½x11½



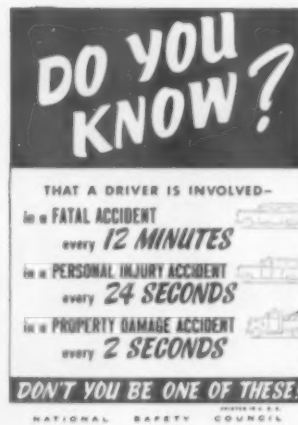
NATIONAL SAFETY COUNCIL  
T-0367-C 25x38  
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V-0406-A 8½x11½



V-0407-A 8½x11½



V-0409-B 17x23

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.



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Safety Clothing & Equip. Co.  
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Standard Safety Equipment Co.  
Surtly Mfg. Co., Inc.

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Central Safety Equip. Co.  
Harrington & King Perforating Co.  
Industrial Products Co.  
Pulmosan Safety Equip. Corp.  
Safety Clothing & Equip. Co.  
Schrader's, A., Son  
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Industrial Products Co.  
Surtly Mfg. Co.

## Guards, Lathe

Bullard, E. D., Co.  
Harrington & King Perforating Co.  
Industrial Products Co.  
Pulmosan Safety Equip. Corp.  
Safety Clothing & Equip. Co.  
Surtly Mfg. Co.

## Guards, Planer

Bullard, E. D., Co.  
Central Safety Equip. Co.  
Industrial Products Co.  
Pulmosan Safety Equip. Corp.  
Safety Clothing & Equip. Co.  
Safety First Supply Co.  
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## Guards, Platen Press

Bullard, E. D., Co.  
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Surtly Mfg. Co.

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Central Safety Equip. Co.  
Electronic Control Corp.  
Harrington & King Perforating Co.  
Junkin Safety Appliance Co.  
Littell, F. J., Machine Co.  
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Surtly Mfg. Co., Inc.

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Safety Clothing & Equip. Co.  
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Standard Safety Equipment Co.  
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Safety Clothing & Equip. Co.  
Safety First Supply Co.  
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Bullard, E. D., Co.  
Central Safety Equip. Co.  
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Industrial Gloves Co.  
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Kimball Safety Products Co.  
Mine Safety Appliances Co.  
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Wheeler Protective Apparel, Inc.

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Safety First Supply Co.

## Gutters, Door Rain

Dazzo Products, Inc.

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Bullard, E. D., Co.  
Chic Maid Hat Mfg. Co., Inc.  
Industrial Products Co.  
Kennedy-Ingalls, V. E., Co.  
McDonald, B. F., Co.  
Safety Clothing & Equip. Co.  
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Milburn Co.  
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Silderm Laboratories  
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West Disinfecting Co.

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Klein, Mathias & Sons  
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C. D. Genter  
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ALSO DIRECTORY SECTION, PAGES 299 TO 303

# Want More Information?

... the Reader Service postcard will get it for you **FAST!**

## Here's how it works—

Printed below are two identical Reader Service postcards — the bottom one for your use; the top one for later readers of this issue. The numbers listed on each card are keyed to products advertised. Just circle the items you want to know more about, and we will ask the manufacturer to send you full information without obligation. Both cards are perforated for easy removal and no postage is required.

## Products Advertised

As you read through this issue of the NEWS, you will find advertisements describing equipment that may help you solve some of your accident problems. Instead of making a "mental note," make sure you get full information by circling the corresponding page number on the Reader Service postcard. The letters, L, R, T and B locate the ads on the page—left, right, top and bottom. IFC—inside front cover; IBC—inside back cover; BC—back cover.

**IMPORTANT**—Be sure to fill in your name, organization and address in the space provided on this side of the postcard.

National Safety News, March, 1958

Please send me more information on the items circled below:

**MARCH 1955**

### PRODUCTS ADVERTISED:

12	13	21	22	23	24	25T	25B	26	27L	27R	30	33	35L	35R
37	38L	38R	39	40	42T	42B	43	44	45	46L	46R	47	48	49
50	51	52	53	54T	54B	55T	55B	56L	56T	56B	57T	57B	57R	58
64	65	66	67	68	69	70	71	72	73	74	75	76	77	78T
78B	79T	79B	80T	80B	81	82	83L	83R	86	89	91	92	93	96
97	99	100	101	102	104	105	107	109	110	111	113	115	116	117
118	119	120L	120R	121	122	123T	123B	124	125T	125B	126	127	128T	128B
129	130T	130B	131	132L	132R	133L	133T	133B	134	137	140	141	143	144
145	147	149	153	154	155	156	157	159	160	161	162	163	165	165A
165B	167	168	169	170	171L	171R	172	173T-B	174L	174R	175T	175B	176	177T
177B	178	179	180	181	182T	182B	183	184T	184B	185T	185B	186T	186B	186R
187L	187T	187B	188T	188B	188R	189L	189R	190T	190B	190R	191B	191R	191B	191T
194	198	201	203	205	206	207	208	209L	209R	212	215	217	219	220T
220B	221T	221B	222T	222B	223T	223B	224L	224R	225T	225B	226T	226B	227L	227R
228	229LT	229LB	229TR	229BR	232	236	239	241	242	243	244	245	246	247
248	249	250	251	252T	252B	253	254	255	256	257T	257B	260	263	265
267L	267R	268	269L	269R	270T	270B	271T	271B	272L	272R	273L	273R	276	279
282T	282B	283L	283R	284	285T	285B	286T	286B	287T	287L	288R	IFC	IBC	BC

NAME.....  
 POSITION.....  
 COMPANY.....  
 ADDRESS.....  
 CITY & STATE.....

Please send me more information on the items circled below:

**MARCH 1955**

### PRODUCTS ADVERTISED:

12	13	21	22	23	24	25T	25B	26	27L	27R	30	33	35L	35R
37	38L	38R	39	40	42T	42B	43	44	45	46L	46R	47	48	49
50	51	52	53	54T	54B	55T	55B	56L	56T	56B	57T	57B	57R	58
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78B	79T	79B	80T	80B	81	82	83L	83R	86	89	91	92	93	96
97	99	100	101	102	104	105	107	109	110	111	113	115	116	117
118	119	120L	120R	121	122	123T	123B	124	125T	125B	126	127	128T	128B
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177B	178	179	180	181	182T	182B	183	184T	184B	185T	185B	186T	186B	186R
187L	187T	187B	188T	188B	188R	189L	189R	190T	190B	190R	191B	191R	191B	191T
194	198	201	203	205	206	207	208	209L	209R	212	215	217	219	220T
220B	221T	221B	222T	222B	223T	223B	224L	224R	225T	225B	226T	226B	227L	227R
228	229LT	229LB	229TR	229BR	232	236	239	241	242	243	244	245	246	247
248	249	250	251	252T	252B	253	254	255	256	257T	257B	260	263	265
267L	267R	268	269L	269R	270T	270B	271T	271B	272L	272R	273L	273R	276	279
282T	282B	283L	283R	284	285T	285B	286T	286B	287T	287L	288R	IFC	IBC	BC

NAME.....  
 POSITION.....  
 COMPANY.....  
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# *The advertising pages of the News*

## **... your guide to reliable suppliers of worthwhile safety equipment**

The advertising policy of the NEWS requires that all equipment and products meet established codes and standards, have the approval of recognized testing agencies, or have proven their value through actual use in industry. Council engineers and technicians screen every

advertisement to make sure that product description is accurate, and performance claims verified by reliable sources. It should not be construed, however, that products advertised are approved or endorsed by the National Safety Council.

FIRST CLASS  
PERMIT No. 834  
CHICAGO, ILL.

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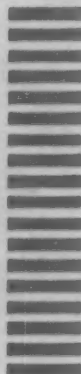
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**NATIONAL SAFETY NEWS**

425 NORTH MICHIGAN AVENUE

CHICAGO 11, ILLINOIS



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425 NORTH MICHIGAN AVENUE

CHICAGO 11, ILLINOIS



**Before you  
mail your  
Reader  
Service  
postcard...**

**TAKE  
ANOTHER  
LOOK  
at the  
ADVERTISING  
PAGES**

Make sure all the items you want to know more about are circled . . . check to make sure your name, organization, and address are printed on the reverse side of the postcard . . . THEN mail it today.



# CESCO

## RIGHT... before your Eyes!



### WHERE TO BUY IT

**ATLANTA, GA.**  
Guardian Safety Equipment Co.  
427 1/2 Moreland Avenue, N. E.

**BIRMINGHAM, ALA.**  
"L. P." Hartless Company  
2627 Seventh Avenue, South

**BOSTON, MASS.**  
General Equipment Corporation  
261 Franklin Street

**BUFFALO, N. Y.**  
The Watson Company  
1443 Main Street

**CHICAGO, ILL.**  
Universal Safety Equipment Co.  
5115 Diversy

**CINCINNATI, OHIO**  
Williams & Co., Inc.  
3231 Fredonia Avenue

**CLEVELAND, OHIO**  
Williams & Co., Inc.  
3700 Perkins Avenue

**COLUMBUS, OHIO**  
Williams & Co., Inc.  
851 Williams Avenue

**DALLAS, TEXAS**  
Guardian Safety Equipment Co.  
990 Jefferson Tower Bldg.

**DETROIT, MICH.**  
Averitt Equipment Company  
19225 Conant Avenue

**EAST ORANGE, N. J.**  
Guardian Safety Equipment Co.  
491 Prospect Street

**HOUSTON, TEXAS**  
Guardian Safety Equipment Co.  
1915 A Westheimer

**INDIANAPOLIS, IND.**  
Averitt Equipment Company  
1917 North Goodlett

**KANSAS CITY, MO.**  
Safety, Incorporated  
17 E. 31st Street

**KNOXVILLE, TENN.**  
Safety Equipment Distributing Co.  
832 W. Main Street

**LITTLE ROCK, ARK.**  
Fire Appliance & Safety Co.  
1114 W. Markham

**LOS ANGELES, CALIF.**  
Guardian Safety Equipment Co.  
7223 S. Main Street

**LOUISVILLE, KENTUCKY**  
Williams & Co., Inc.  
1109 S. Preston Street

**MILWAUKEE, WIS.**  
Universal Safety Equipment Co.  
3155 S. 7th Street

**PEORIA, ILL.**  
Universal Safety Equipment Co.  
116 S. Garfield

**PHILADELPHIA, PA.**  
Guardian Safety Equipment Co.  
214 S. 45th Street

**PITTSBURGH, PA.**  
Williams & Co., Inc.  
901 Pennsylvania Avenue

**ST. LOUIS, MO.**  
Safety, Inc.  
3608 Olive Street

**ST. PAUL, MINN.**  
Continental Safety Equipment, Inc.  
1551 Selby Ave

**SALT LAKE CITY, UTAH**  
Universal Fire & Safety  
Equipment Co., Box 1587

**SAN FRANCISCO, CALIF.**  
Guardian Safety Equipment Co.  
101 Hawthorne Street

**SPOKANE, WASH.**  
Spokane Safety Appliances  
W. 314 Pacific Ave.

**TOLEDO, OHIO**  
Williams & Co., Inc.  
946 Kane Street

**TULSA, OKLA.**  
Guardian Safety Equipment Co.  
1742 S. Main Street

**WICHITA, KANS.**  
Guardian Safety Equipment Co.  
723 S. Broadway

**MEXICO CITY, D. F.**  
Safety Equipment S. A.  
Sullivan-95

**MONTREAL, CANADA**  
The Butler Optical Company, Ltd.  
1528 Mountain Street

CHICAGO EYE SHIELD COMPANY • 2306 Warren Boulevard, Chicago 12, Illinois



# CESCO FOR SAFETY



Eye Protection



This  
**NEW**  
**FLEXIBLE**  
**MASK**  
**GOGGLE**

Offers Excellent  
Impact Resistance!

**LIGHT...COMFORTABLE**  
**INEXPENSIVE**

Here's our new moderately-priced No. 482 Flexible Goggle of the single aperture mask type. It's light in weight — fits the face snugly and comfortably with a cushion-like effect. Extra wide and with ample clearance, it can be worn over most types of personal glasses or Safety R glasses. The interchangeable one-piece acetate lens is *optically correct\**, and offers superior resistance to impact.

While made of a soft plastic material for flexibility, frame is solid and fits facial contours closely for full protection. There is an unusually wide field of vision for worker comfort, safety and efficiency.

Lens is easily removed and replaced and is available either clear or in green acetate. Elastic headbands are easily adjustable.

Goggle can be adapted for use as a chemical goggle by eliminating perforations in frame and fitting with vinylite lens and adjustable plastic headband. It is resistant to acids and alkalis. When ordering for chemical use please order as No. 484 or 485.



**No. 482** Clear Frame, Clear or Green Lens

**No. 483** Green Frame, Clear or Green Lens

**No. 484** Chemical Goggle, Clear Frame, Clear or Green Lens

**No. 485** Chemical Goggle, Green Frame, Clear or Green Lens

**RECOMMENDED USES:**

For protection against flying particles striking from any direction, on such operations as babbitting, chipping, cutting rivets, light grinding, on hand or machine tool work, or in occupations where spark or explosion hazards are present.

†T.M. Reg. by American Optical Company

American Optical



SAFETY PRODUCTS DIVISION

\*The AO trademark, and the engineering and research in back of the trademark, are your assurance of optically correct eyewear with every AO goggle.

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

# **NATIONAL SAFETY COUNCIL**

## **OCCUPATIONAL SAFETY SERVICES**

**SERVICE GUIDE 2.1**

**MARCH 1955**



*National Safety News*  
Vol. 1, No. 3, Part 2  
Chicago, Ill.



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# NATIONAL SAFETY COUNCIL

## OCCUPATIONAL SAFETY SERVICES



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**ABBREVIATIONS**—To conserve space, the abbreviations listed below have been used to identify various publications throughout this Service Guide.

**APM**—Accident Prevention Manual for Industrial Operations (page 7)

**SPP**—Safe Practices Pamphlets (page 7)

**SIC**—Safety Instruction Cards (page 7)

**Talk**—Foremen's 5 Minute Safety Talks (page 18)

**Tailboard Talk**—30 Tailboard Talks (page 18)

**C & M**—5 Minute Safety Talks for Construction and Maintenance Foremen (page 18)

## Keep the management group in back of your Safety Program



with a regular flow of timely, pertinent safety information that whets their interest in accident prevention.

The technical and administrative materials shown on the following pages are "bread and butter publications" to the industrial safetyman—but many of them are also ideal for winning the active support and participation of various levels of management.

Check over the names in your management group (including branch plants) and order the publications for each key person that will keep him in back of your safety program.

## And put **NATIONAL SAFETY NEWS** at the top of your list



Thirty-two thousand management personnel receive this magazine each month. It is the best, single source of up-to-date information on safety engineering and program developments. It features from 100 to 200 pages of stimulating, informative articles written by experts in the field; factual data on accident hazards and problems; safety success stories; industrial hygiene and health information; news about people, products and events.

By keeping key executives advised as to what others are doing about safety, NATIONAL SAFETY NEWS paves the way for engineering and program improvements in your own organization.

Arrange for a personal subscription for the people most directly concerned with determining safety policies and activities.

Also plan your lists of other executives and supervisors to whom copies should be routed each month. Last, plan your supply of the magazine so that you will have copies to route to key people when articles of special interest to them appear.



MEDICAL  
DIRECTORS



SAFETY  
ENGINEERS



TRANSPORTATION  
SUPERVISORS



PLANT  
MANAGERS



MAINTENANCE  
FOREMEN

TRAINING  
SUPERVISORS



# Administrative Units

**Supply essential safety information  
to the right people . . . in balanced quantity  
on the right subjects . . . all the year around**

**WHAT THEY ARE** An Administrative Unit is a cream-of-the-crop combination of monthly, annual, and special Council materials selected to provide a balanced information service for the key men in your safety program. Each Unit includes copies of know-how publications, such as a safety manual, and subscriptions to news-type publications, such as the NATIONAL SAFETY NEWS and News Letter. When ordered as a Unit, these publications cost at least 10% less than they would if purchased individually.

**HOW THEY WORK** The Unit provides the subscriber with a background of safety information, and keeps him up to date with safety engineering and program developments. The Unit permits participation in Council Sectional activities. The Unit keeps subscribers informed about new Council services and materials. Unit

holders receive all Council Service Guides, announcements, and literature describing new safety aids, as well as samples of many of the new publications.

**WHO NEEDS THEM** - "A" Units are for full-time safety supervisors. "B" Units are for people with substantial safety responsibility: personnel directors, industrial training supervisors, plant engineers, insurance engineers and inspectors, part-time safety supervisors of installations with 100 to 400 employees. "C" Units are for people with incidental safety responsibility: medical directors, chiefs of plant protection, maintenance foremen, part-time safety supervisors of installations with less than 100 employees. In addition to the eight Units described below, there are many other Units for people interested in various fields of safety. Information on these Units will be sent on request.

## HOW TO ORDER

When ordering Units, be sure to specify: name and title of the individual, company name, street address, city, zone, and state, type of Unit desired, choice of sections. You'll find a list of Council sections under "News Letters" on page 4.

TYPE OF ADMINISTRATIVE UNITS	General	Industrial			Transportation			Con- struction
	AA-1	A-1	B-1	C-1	A-2	B-2	C-2	B-11
Services Included:								
1. National Safety News, monthly	1	1	1	1	1	1	1	1
2. Public Safety Magazine, monthly	1	1	1	1	1	1	1	1
3. Sectional Enrollment and monthly News Letter	3	3	2	1	3	2	1	1
4. Industrial Supervisor, monthly	1	1	1	1	1	1	1	1
5. Accident Rates pamphlet, annually	2	1	1	1	1	1	1	1
6. Manuals, as issued								
a. Accident Prevention Manual	1	1	1	1	1	1	1	1
b. Handbook of Accident Prevention	1	1	1	1	1	1	1	1
c. Fleet Manual, large	1	1	1	1	1	1	1	1
d. Fleet Manual, small	1	1	1	1	1	1	1	1
e. Construction (A.G.C.) Manual	1	1	1	1	1	1	1	1
7. Congress Transactions, annually								
General	1	1	1	1	1	1	1	1
Subject Sessions	1	1	1	1	1	1	1	1
Section Meetings	3	3	2	1	3	2	1	1
8. National Safety Calendar, annually	1	1	1	1	1	1	1	1
9. Accident Facts, annually	1	1	1	1	1	1	1	1
10. Technical releases for your industry, as issued	1	1	1	1	1	1	1	1



#### HOW TO START A SAFETY PROGRAM

Defines the organization of a simple and economical safety program. Explains how to get hold of accident problems—not the engineering details but the management of an efficient program. Describes what to do first to control such problems as health, personal injuries. Applicable to any kind of business enterprise, regardless of size. 48 pages, 4 1/2" x 7".

#### PLUS COSTS OF ACCIDENTS

Explains how any businessman can eliminate the causes of accidents, boost efficiency and lower both the direct and indirect costs of doing business. Shows how safety follows when you put common-sense principles to work. Lists 7 easy-to-follow steps to take in establishing a safety program. Illustrated throughout, 2-color. 8 pages, 6" x 9".



#### NEWSLETTERS

Newsletters are the safety idea swap shops for various industries with specialized problems. Edited by volunteers from each group, they provide you with a valuable source of information slanted to your own operations—new methods and equipment, novel safety promotional stunts and gadgets, recent technical developments, plus news of Section meetings, projects, people.

Monthly Newsletters are particularly helpful to organizations with diversified operations or scattered locations. You can select Newsletters to match specific operations; address subscriptions directly to key personnel at each location—your nurses, plant managers, training personnel, maintenance foremen, transportation supervisors, and safety engineers. Four pages, 8 3/8" x 10 7/8". Newsletters are published monthly for the following:

Aeronautical Industries  
Air Transport  
Automotive and Machine Shop  
Cement and Quarry  
Chemical  
Coal Mining  
Commercial Vehicle  
Construction  
Electrical Equipment  
Fertilizer  
Food  
Glass and Ceramics  
Hospital Safety Service  
Marine  
Metals  
Meat Packing, Tanning and Leather Products  
Mining (other than coal)  
Occupational Health Nursing  
Petroleum  
Power Press and Forging  
Printing and Publishing  
Public Employee  
Public Utilities  
Pulp and Paper  
Railroad  
Rubber  
Textile  
Transit  
Wood Products

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices

#### CONGRESS TRANSACTIONS

The Congress is the annual safety idea free-for-all. Literally hundreds of years of successful accident prevention experience back up the speakers and panel members who participate. Condensed, and published in 30 pamphlet-size sections, they are ideal for distributing throughout an organization.

Safety men find the TRANSACTIONS Set a rich source of ideas from other industries which can be adapted to their own programs; as reference material for speeches, articles and bulletins.

#### SAVE 45%

To encourage more widespread knowledge of the various fields of safety, the Complete Set of 30 volumes may be ordered for little more than 1/2 the cost of the individual volumes.

#### LIST OF VOLUMES

General Sessions and Detailed Index to all Volumes  
Aviation: Aeronautical Industries Section  
Air Transport Section  
Cement and Quarry Industries  
Chemical Industries  
Coal Mining Industry  
Construction Industry and Public Employment (Public Employee Section)  
Farm Safety  
Fertilizer Industry  
Food and Meat Packing and Leather Industries  
Glass and Ceramics Industry  
Home Safety  
Industrial Subject Sessions (Sponsored by ASSE)  
Maritime Industries (Marine Section)  
Metals Industry  
Metals Products Industries (Automotive and Machine Shop Section Power Press and Forging Section)  
Mining Industry  
Motor Transportation Industry (Commercial Vehicle Section)  
Occupational Health Nursing Section  
Petroleum Industry  
Printing and Publishing Industry  
Public Utilities Industries and Electrical Equipment Industry  
Pulp and Paper Industry  
Railroad Industry  
Rubber Industry  
School and College Safety  
Textile Industry  
Traffic Safety  
Transit Industry  
Wood Products Industry  
Early Morning Sessions, "Let's Get Personal"



# NATIONAL SAFETY COUNCIL

# Services

## CONSULTATION SERVICE

The Council's staff of engineers, safety technicians and industrial hygienists are at your command by mail, wire or phone. They are equipped to give you unlimited assistance in planning and running a successful program of accident prevention.

## LIBRARY SERVICE

The world's biggest collection of safety information—thousands of publications, articles, photographs, illustrations on every conceivable safety subject—is yours to use. Material on any subject will be mailed to you on request.

## AWARD SERVICE

The Council evaluates each organization's occupational accident prevention record on a sound statistical basis. The Award of Honor, Award of Merit, Certificate of Commendation, and President's Letter are given in recognition of various degrees of progress.

## EMPLOYEE PUBLICATIONS SERVICE

The Council will keep you supplied with safety publicity material for company magazines, newspapers, and bulletins. Mats and proofs of safety cartoons and a monthly newsletter containing safety news items of general interest are yours for the asking.

## NATIONAL SAFETY CONGRESS

The biggest annual event in safety—a week of talks and discussions by the country's leading safety authorities—exhibits of safety equipment. Chicago plays host to the 12,000 delegates in mid-October each year. You can send any number of representatives to learn about the latest safety developments and to meet and exchange ideas with safety men in your industry.

## SECTIONAL ACTIVITIES

Part of the income from Council dues and publications covers the costs involved in developing safety codes and safe operating procedures for your industry and other technical studies. Intra-industry contests are also supported by dues. These sections sponsor annual con-

tests: Aeronautical Industries, Chemical, Commercial Vehicle, Fertilizer, Food, Glass, Marine, Meat Packing, Metals, Pulp & Paper, Petroleum, Printing & Publishing, Public Utilities, Rubber, Tanning & Leather, Textile, Transit, and Wood Products. Any Council member or Federal installation qualified under rules established by the sponsoring section may compete by submitting a simple monthly report. Entrants compete only with organizations of their own size which have similar operations. Each month you receive a report of your standing. If you win, there's a handsome trophy that's yours to keep. Contest rules and report forms are sent on request.

## STATISTICAL SERVICE

The information maintained on accident frequency and severity in 200 industries permits you to check your standing and the progress of your program against the records of other organizations doing similar work. Charts and tables are prepared on unsafe acts, agencies of injury and unsafe conditions that lead to accidents.

## PUBLIC INFORMATION SERVICE

Due to the ever expanding publicity activities and services directed to newspapers, magazines, radio and television stations throughout the country, the American worker and his family receive an average of at least two safety messages a day.

## PERSONNEL BUREAU

The Council maintains a confidential file of safety men who are interested in changing jobs. If you need a safety director or engineer, the Council can help you find the right man for the job.

## SPEAKERS BUREAU

A file of both volunteer and professional speakers is maintained to place you in contact with persons qualified to give safety talks to any type of audience.

## PUBLICATIONS SERVICE

More than 4,000 items produced by the Council for promoting accident prevention are available to members and Federal installations at nominal rates—in most cases at 40% to 50% of the established non-member rates.





## *the* SAFETYMAN'S LIBRARY...

**a LIFE-SAVER when you need the right answer—FAST**

A safety man doesn't have to know all the answers, but he must know where to find them—QUICKLY

### *the Safetyman's Library includes*

- the 812-page 2nd Edition of ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPERATIONS
- a loose-leaf binder of 51 GENERAL SAFE PRACTICES PAMPHLETS
- 223 DATA SHEETS in two indexed binders
- a binder of 132 DETAIL SHEETS
- 735 SAFETY INSTRUCTION CARDS complete with index, numerical dividers and a file case

By ordering the Safetyman's Library as a unit, you save 10% of the total cost of the items included.

The component parts are described more fully on the opposite page.

The Safetyman's Library, a collection of the five most widely used and most frequently needed safety reference publications, puts the answer to practically every problem you will encounter at your fingertips.

These reference volumes have been designed so that individual foremen, supervisors, training supervisors, doctors, nurses, safety committeemen and other key personnel involved in the safety program can be given the portions of each publication which pertain to their work.

See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices

## ACCIDENT PREVENTION MANUAL

*"most complete safety reference ever published"*

A summation of the 38-year safety experience reported to the Council by many hundreds of its industrial members. It is the standard reference for anyone with substantial safety responsibility.

The 2nd Edition, published in 1951, contains 812 pages—50% more than the previous edition—completely revised, with 12 new sections added. Each of the 26 sections are also published as SAFETY MANUAL REPRINTS—separate 32-page 6" x 9" pamphlets—to permit low-cost distribution of pertinent material throughout an organization.



## SAFE PRACTICES PAMPHLETS

*"supplementing the ACCIDENT PREVENTION MANUAL"*

Detailed studies of important accident and health problems, 8 1/2" x 11", 4 to 8 pages in length. The 51 pamphlets comprising the revised general set have been selected for their continued use as supplements to the 2nd Edition of the ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPERATIONS. Pamphlets formerly published but not listed in the index on the following three pages have been discontinued in favor of the new SAFETY MANUAL REPRINTS.

The GENERAL PAMPHLET SET is in a 1 1/2" three-ring binder. The SPECIAL INDUSTRY PAMPHLET SET (not included in the Safetyman's Library) is in a 1" three-ring binder. Selected pamphlets in both sets may be ordered individually in any quantity.



## DATA SHEETS

*"concise, reliable solutions to your problems"*

Each DATA SHEET gives you the most authoritative information possible on a specific subject—including the experience of many companies which have dealt with the subject and assisted in preparing the data. They are 8 1/2" x 11" in size; 1 to 8 pages in length. Complete sets of DATA SHEETS are now available in two 1 1/2" three-ring binders—indexed for easy reference. Selected DATA SHEETS may be ordered in any quantity.



## DETAIL SHEETS

*"show how to build it faster—cheaper—safer"*

Eliminate guesswork and long explanations. DETAIL SHEETS are the easy, time-saving way to build safety devices on the job. They are simple working drawings that any competent workman can follow. May be ordered as a set, complete with three-ring binder, or by individual sheets. 8 1/2" x 11", 1 to 4 pages in size.



## SAFETY INSTRUCTION CARDS

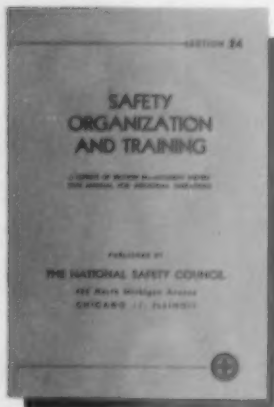
*"the handiest file of safety check lists you've ever seen"*

These 3" x 5" cards are concise check lists of safe practices and accepted methods of performing specific operations. They are invaluable for preparing job analyses, writing speeches and articles, planning safety meetings.

The Complete Set consists of approximately 735 cards, including motor transportation and off-the-job safety subjects, a 2-way index, a set of numerical dividers and a metal file case. The smaller Industrial Set contains approximately 500 cards of interest to all industry, plus the Special Industry cards that pertain to the purchaser's operations. A Non-Industrial Set also may be ordered as a separate item. See Service Guide 5.2 for a listing of the subjects included in the three sets.



All the component parts of the Safetyman's Library are listed separately under the various subject listings.



#### SAFETY ORGANIZATION AND TRAINING

Basic elements of organization, safety committees, inspections, engineering, purchasing, small plants, scattered operations, employee participation for supervisors, and integrating safety with other training. A reprint of Section 24—Accident Prevention Manual for Industrial Operations. 24 pages, 5 3/4" x 8 3/4".

#### THE SAFETY MAN'S RESOURCES

Service organizations, standards and specifications groups; fire protection organizations, federal, state and provincial departments, associations of governmental labor officials, international safety, insurance and trade associations, insurance services, professional societies. A reprint of Section 26—Accident Prevention Manual for Industrial Operations. 36 pages, 5 3/4" x 8 3/4".



#### NATIONAL DIRECTORY OF SAFETY FILMS

A comprehensive listing of 963 motion pictures and slidefilms, both sound and silent, for safety education within business and industry, on the farm, in homes, and on the streets and highways. Sources and basis of availability shown for each film. 48 pages, 8" x 11".



#### SERVICE CREDIT

your safety checking account

Purchased Service Credit saves time and money by eliminating almost all of the paper work entailed in placing an order—requisitions, purchase orders, bookkeeping, invoicing statements, check writing—makes it easy to obtain small purchases or large. Just send the Council one purchase order for the amount of service credit you wish deposited to your account. Purchases may then be made by phone, memo or postal card. Your service credit may be used for any item or service the Council provides . . . it's good indefinitely . . . and you will be informed regularly of your credit balance.



#### SHOWMANSHIP IN SAFETY

Here are 160 of the brightest, most unusual and most successful safety promotional ideas of the last 40 years. Old or new, you're bound to find loads of attention-getting gimmicks for publicity stunts, pepping up safety meetings, getting bulletin boards looked at. 2-color, 64 pages. 5 1/2" x 8".



#### INVISIBLE RED INK

Originally planned as an appeal to business management to recognize

the importance of planned safety activities, this film is equally good as an employee indoctrination film. It will show your workers the "why" behind your safety program—what it means to them and to your company; that their paychecks . . . possibly their lives are tied up with its success and their support. 20 minutes. [Class VIII Film]

#### THE WOMAN ON THE JOB

A new survey on the health and safety problems of women in industry. Accidents and occupational diseases, gynecological and other physical problems, job clothing, placement, training, and supervision are some of the important subjects covered. Green and pink hard cover book with illustrations. 96 pages, 6" x 9".



Safety Organization and Training—Section 24 APM

Safety Man's Resources, The—Section 26 APM

How to Prepare a Safety Manual—Reprint General 33

Plus Costs of Accidents—Booklet

Safety Devices and Ideas—Booklet

Showmanship in Safety—Booklet

National Directory of Safety Films

How to Start a Safety Program—Booklet

Organizing a Complete Industrial Safety Program—SPP 42

Safety Meetings—SPP 77

Topics for Safety Meetings—SPP 93

Applied Engineering Principles Reduce Costly Accidents—Reprint 57

Coordinating Safety in Industrial and Vocational Training Programs—SPP Voc. I

We Fix Responsibilities (French Edition)—Reprint General I

See Page I for code to abbreviations

See pages 66 to 69 for Index and Prices



# Safety

## TRAINING INSTITUTE



### FIVE-DAY COURSE IN

## FUNDAMENTALS OF INDUSTRIAL SAFETY

The aim of this course is to give practicing safety men a broad view of the whole job, an understanding of the principles of industrial accident prevention, and practical help for their day-to-day operations.

Though the course is particularly valuable for new-comers to safety work, it offers the experienced safety man a stimulating opportunity to view his activities with a new perspective—to re-evaluate some of the things he's known, pick up new ideas, and talk over specific problems with instructors and other class members. Each student receives a 45-page detailed course outline and a kit of reference materials for follow-up safety. Fully half of the 1500 graduates have had two or more years experience before attending. Their job titles have ranged from foreman to vice-president for industrial relations.

The 1955 courses will be held at the Council's Chicago offices March 14-18, May 16-20, June 6-10, November 14-18.



### SCHEDULE OF SUBJECTS

#### MONDAY

Survey of Interests of the Group  
Basics of Industrial Accident Prevention  
Library Services  
Accident Records and Analysis  
Industrial Health Hazards and Controls

#### TUESDAY

Methods Engineering and Safety  
Getting the Most Out of Council Membership  
Organizing and Operating Your Safety Program  
Plant Inspections

#### WEDNESDAY

Creating and Maintaining Interest in Safety  
Literature and Sources of Safety Information  
The Foreman's Part in Accident Prevention  
Mechanical Safeguarding

#### THURSDAY

Personal Factors in Safety  
Methods of Developing a Safe Working Force  
Personal Protective Equipment  
Fire Prevention  
Problems and Solutions—Round Table

#### FRIDAY

Discussion of Quiz Questions  
Your Place in Community Safety  
Publicity in Plant and Community  
Summary

\* For further information about these courses, write to the Director of Training, Industrial Department, National Safety Council.

### FIVE-DAY COURSE IN

## SAFETY MANAGEMENT TECHNIQUES

This advanced course is for safety men who feel they have sufficient knowledge of the fundamentals, and for those who have completed the basic course. It is taught by Council staff members as well as outside specialists in the fields of writing, speaking, psychology, visual aids and photography. Held April 18-22, 1955.

## SAFETY COMMITTEES

### THE MAN WITH THE BADGE



#### THE MAN WITH THE BADGE

Shows safety committeemen how to deal with committee problems, tips on conducting safety inspections, committee meetings, getting along with supervisors and workers. Cartoon illustrations. 64 pages, 4" x 6 1/2".

#### SAFETY COMMITTEES

Safe Practices Pamphlet 72 discusses the purpose and organization on a safety committee in small, medium and large size plants. Explains how to maintain interest in the committee among employees and lists the duties of the committee members. 8 pages, 8 1/2" x 11".

### Safety Committees



#### COMMITTEE BADGE

A handsome service emblem in glittering green and white gem-like hard-fired enamel. The outline and lettering has a highly polished gold finish and the entire badge is protective coated. Joint, pin and safety catch are nickel-silver. 1" diameter.



#### PERSONALIZED COMMITTEE BADGE

Of the same high quality finish as the badge above, the top and bottom panels can be die struck with any title or company name for an additional die charge of \$20.00 per panel (\$40.00 for both panels—die charges will not be repeated on subsequent orders). No charge is made for use of stock "COMMITTEE" die in top panel.



#### MERITORIOUS SERVICE AWARDS

Striking new award pins in sparkling, hard fired red, white and green jeweler's enamels with polished gold lettering encircled by gold laurel wreath. The pins illustrated are carried in stock. Pins can be made with your company name in outer band or another legend in center. Nickel-silver joint, pin and safety catch. Write for details. These emblems may also be had on award incentives, as illustrated on the right.



#### SAFETY COMMITTEEMAN

1. Be alert for unsafe plant conditions and unsafe practices, whether you are an official inspection team or not.
2. Make a practice of sitting up the job position—once weekly, if any earlier one day watch. Notice if there are unsafe practices included which should be noted against.
3. Observe new employees and assist them, as far as you can, in learning safe operating habits.
4. Leave the hazards of the more general plant operations, such as grinding or chipping WITHOUT GOGGLES; using MASHROOMS; tools or tools with SPINNING HANDLES; using trucks TOO FAST. Make notes of violations of safety rules.
5. Be able to recognize near-accidents that do not cause injuries. They indicate unsafe practices and conditions that should be corrected without delay.
6. If you notice unsafe acts or habits on workers, inquire if they have reported first aid. Consider them in a friendly way about the danger of violation.

SAFETY INSTRUCTION CARD No. 341

National Safety Council

#### CHAIRMAN—Safety Committee

A successful chairman leads up a successful committee. Every member has definite assignments.



- Short regular meetings, full attendance, and planned activities make committees lively.
- Open and close meetings on time. Give everyone a chance to enter discussion.
- Clean up unfinished business, especially left-over safety suggestions and inspection recommendations. Give a definite answer to each.
- Get at the root of the trouble in new hazards or bad practices reported. Act on inspection recommendations.
- Keep accident records, analyses and summaries strictly up-to-date.

SAFETY INSTRUCTION CARD No. 296

National Safety Council

Chairman—Safety Committee—SIC 296  
Safety Committeemen—SIC 341



#### MERITORIOUS AWARDS

An outstanding selection of high quality, low-cost awards for men and women can be obtained with the Meritorious Service Emblem, as illustrated and described at left. Available are tie bars, lighters (illustrated), key chains, bracelets, money clips and belt buckles. Write for prices and complete information.





## PICK YOUR SAFETY TARGET

Shows foremen how to analyze and classify accidents, interpret facts and translate them into action. Combined cartoons and live shots. 13 minutes.

35mm sound-slidefilm—color (Class III Film). 16mm sound-motion picture—color (Class VI Film) or black and white (Class V Film). ⚡

# STATISTICS—RECORDS—ANALYSIS



## ACCIDENT RECORDS

Report forms, accident analysis chart, use of reports, accident investigation, computing rates, accident analysis, accident costs. A reprint of Section 25—Accident Prevention Manual for Industrial Operations. 30 pages, 5 3/4" x 8 3/4".

## ACCIDENT FACTS

The most complete and authoritative source of accident statistics. This annual roundup of facts and figures on accidents in every field of safety puts the answers at your finger tips. It's easy to use, easy to understand. Normally released in July, each issue contains over 100 pages of information on the accident picture for the previous year.



## ACCIDENT ANALYSIS CHART

For use by small plants, hotels and other service industries to record frequency rates and general accident history of the organization. Printed 2 sides, in pads of 50. 8 1/2" x 11".

## ACCIDENT RECORD FORMS

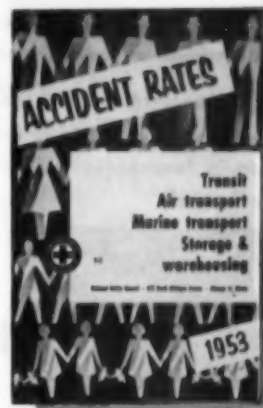
For use in recording, reporting, and analyzing various types of accidents. Please use both number and name of form when ordering. Sample copy free on request.

- IS-1A—Supervisor Accident Report (8 1/2" x 11" 2 sides).
- IS-3 —Industrial Employee Injury Record (4" x 6" 1 side card).
- IS-4 —Industrial Injury Summary (8 1/2" x 11" 2 sides).
- IS-5A—Monthly Summary of Industrial Injuries (8 1/2" x 4" 1 side).
- IS-6 —A First Aid Report Form. In pads of 100. (Size 4" x 6").
- IS-7 —Department Supervisor's Accident Cost Report (8 1/2" x 11" 1 side).
- IS-8 —Investigator's Cost Data Sheet (8 1/2" x 11" 2 sides).

- Stop, Look and Listen—Film (Described on page 17)
- How to Inspect for Accident Prevention—Physical Condition, Buildings—Reprint Gen. 16
- Safety Inspections—SPP 75
- Safety Inspection—SIC 325
- Safety Inspection—SIC 333
- Safety Inspection Check List—(Check List of Safe and Unsafe Conditions. 8 1/2" x 11", pads of 50.)
- Safety Observation Plan—SPP 109

## ACCIDENT RATES PAMPHLETS

These pamphlets review the accident experience of about 200 industries and about 30 general groups annually. The pamphlet for your industry will enable you to compare your company's accident frequency and severity rates with those of other companies doing similar work. Size 5 1/2" x 8 1/2".



## LIST OF PAMPHLETS

- Automobile, Aircraft Manufacturing, Railroad Equipment, Shipbuilding
- Chemical, Rubber
- Communications, Electric Utilities, Gas Utilities
- Construction
- Iron & Steel Products, Sheet Metal, Non-Ferrous Metals
- Lumber, Wood Products
- Machinery, Electrical Equipment
- Food, Meat Packing, Leather, Tobacco
- Mining, Quarry, Cement, Glass, Clay Products
- Petroleum
- Pulp & Paper, Printing & Publishing
- Steel, Foundry
- Textile
- Trade, Service, Miscellaneous Manufacturing
- Transit, Air Transport, Marine Transport, Storage & Warehousing

Estimating Accident Costs in Industrial Plants—SPP 111

What Does It Cost—How Much Does It Save?—Reprint 51

Accident Records and Forms—See also Motor Transportation, page 34

Accident Records—SPP 21

See pages 66 to 69 for Index and Prices  
See Page 1 for code to abbreviations

## the KEY MEN in your safety program



Your supervisors and foremen are the management people nearest the accident firing line. They give most of the job instruction; they are responsible for keeping equipment in safe condition—spotting hazards before they become accidents. Their approach to human relations influences employee attitudes. How well these vital jobs are carried off can make a BIG difference in your accident experience.

The materials shown on the following pages are among the most widely used by American Industry to equip foremen to handle their safety responsibilities effectively.

- They teach your foremen the fundamentals of accident prevention as it relates to their jobs.
- They build interest in your program by showing your foremen how safety boosts production and improves morale.
- They give your foremen a basic understanding of human relations and show how to use this knowledge on the job.

## Your best bet is

INDUSTRIAL

# Supervisor

### the safety magazine for foremen

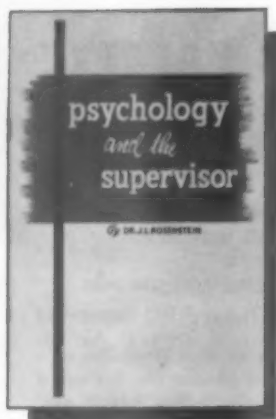
INDUSTRIAL SUPERVISOR takes over where other training aids leave off. It keeps your foremen and supervisors sold on safety. It impresses them with the importance of the part they play in preventing accidents. It never lets them forget that more efficient production—with safety—is a goal that deserves the best they can give.

Any supervisor worthy of his title is glad to get this magazine because it helps him do a better job in each of his many roles—teacher, detective, inspector, leader, counselor and friend. He has a daily need for the how-to-do-it information, the practical psychology and human relations features.

INDUSTRIAL SUPERVISOR is saved—in whole or in part—for reference and review—by nearly all subscribers. For best results, give each supervisor and foreman his own copy each month.







### PSYCHOLOGY AND THE SUPERVISOR

The series of articles by Dr. J. L. Rosenstein that appeared in the **INDUSTRIAL SUPERVISOR** was so popular that it has been reprinted in booklet form. The book discusses the basic motivations of human nature—fear, worry, personality problems, etc. Written in an entertaining style, illustrated. 32 pages, 5½" x 8½".



### HANDBOOK OF ACCIDENT PREVENTION

Where safety is a part-time job, as with foremen, the Handbook is the safety guide you need. It covers the essentials of a sound safety program such as inspections, records, material handling, fire prevention and other important subjects. 96 pages, 5⅞" x 8¾".

## Two popular group discussion courses

### SAFETY IN FOREMANSHIP



A set of 12 pamphlets, each devoted to a major part of the accident problem, and treated wholly from the foreman's viewpoint. These pamphlets provide a ready-made course for teaching the principles of accident prevention to supervisors. An instructor's outline is provided with each order. 6" x 9" with from four to eight pages. Booklet No. 1 is an introduction to the booklets to follow.

2. The Foreman's Opportunity—Production With Safety (foremen's responsibility for the safety of workers)
3. Have You Thought About This? (the human suffering caused by accidents)
4. Do You Know How Much An Accident Costs?
5. Safeguards—Why and How
6. Look Out For That First Step! (safety instruction for the new worker)
7. Are You Following Through?
8. What Accident Statistics Tell the Foreman (enforcement of safety instructions)
9. Why And How To Be A Good Housekeeper
10. Detecting And Correcting Unsafe Conditions
11. After An Accident—What?
12. What About Fire In Your Department?

### PSYCHOLOGY OF SAFETY IN SUPERVISION

A tremendously popular set of booklets written by Dr. J. L. Rosenstein, noted industrial psychologist, author and lecturer. All six booklets in this series do much more than encourage safe practices. They teach supervisors to do a better job of controlling their people by developing a better understanding of worker attitudes and actions—how to deal with the fundamental human relation problems that supervisors run up against day after day. 6" x 9", 12 pages.



1. You Can't Change Human Nature (explains common peculiarities of human nature)
2. What Is Your UQ? (the importance of a supervisor having a high "understanding quotient")
3. Teaching Safety On The Job (how lack of sufficient knowledge can cause workers to have accidents)
4. People Act Alike (explains in what way normal people are all alike and how they differ from each other)
5. Safety Takes Teamwork (suggests different techniques for keeping employees safety minded)
6. You Are Human Too (shows supervisors how to evaluate themselves)

### Other publications

#### PREPARING FOREMEN AND SUPERVISORS

Industrial Supervisor—Magazine  
 Handbook of Accident Prevention—Booklet  
 Safety Management for Foremen—Film Series  
 Safety in Foremanship—Booklet Series  
 Psychology and the Supervisor—Booklet  
 Psychology of Safety in Supervision—Booklet Series  
 A Course of Training Foremen for Safety Work—SPP CMST 5-1  
 Foreman's Big Job, The—Reprint Gen. 28  
 A New Plan for Rating Section Foremen—Reprint Coal Mining 8  
 A Critical Study of the Foreman—Reprint Gen. 26  
 5 Minute Safety Talks for Foremen—Books 1, 2, 3, 4, 5

30 Tailboard Talks—  
 Speaking Straight—Thinking Straight—Booklet  
 Speaking of Safety—Film  
 How to Make the Safety Speech—Booklet  
 1,000 Safety Bell Ringers—Booklet  
 Supervising for Safety—Film Series  
 Human Factors in Safety—Film Series  
 A Gray Day for O'Grady—Film  
 All Out for Safety—Film  
 We Fix Responsibilities (French Edition)—Reprint Gen. 1

See Page 1 for code to abbreviations  
 See pages 66 to 69 for Index and Prices



**featuring the frustrated,  
fuming (but funny)  
foreman—Gustave G. O'Grady**

Though the popular safety skeptic, Gustave G. O'Grady does the talking, the ideas he dramatizes belong to Dr. Arthur Secord, well-known lecturer on human relations from the faculty of Brooklyn College. This foreman training series is based on Dr. Secord's Early Morning Sessions of the 1952 Congress.

In three narrative-style films, foreman O'Grady develops the Secord formula with a series of revealing "boss-worker" episodes. Your foremen will laugh when they see some of their own mistakes through O'Grady's eyes, but they'll learn at the same time how to become more effective in handling people. Each film deals with one specific trait of successful supervisors. Together, they drive home the idea that happy workers are less likely to have accidents—that worker happiness depends a lot on intelligent supervision. Running time is 12 minutes for each film. Available in either 35mm sound slidefilm (Class I Films) or 16mm sound motion picture (Class V Films).

## "SUPERVISING FOR SAFETY"



**FRAGILE—HANDLE  
FEELING WITH CARE**

After studying the discontented attitudes of some of his employees, O'Grady reaches the decision that as supervisor, a really important part of his job is to consider the feelings of his employees—that workers want to know the "reasons why" for rules or changes. The supervisor must give them recognition for their ideas, take their requests into consideration, and give them an occasional pat on the back.



**IT'S AN ORDER**

O'Grady is having accident trouble when he receives a note from management on "how to give an order." He's indignant at this suggestion but after a series of humorous misunderstandings, O'Grady decides that there's more to giving orders than he realizes. He re-reads the instructions: say what you mean; make written orders clear; not too many orders at once; show by doing; explain why.



**CALL 'EM ON THE CARPET**

Confronted with the problem of trying to correct some of his men, O'Grady realizes that each worker is different—each must be treated as an individual. He learns too, to "cool off" before he "sounds off"—to correct a man in private, explain the reasons for his instructions, work in a compliment when it's deserved.

## Two other "O'Grady" films



**ALL OUT FOR SAFETY**

Story of what happens to supervisor O'Grady when he attends a safety conference. He learns the value of meeting with others in his field, seeing new devices and ideas which will profit him, finds out that other people have similar problems—and how they solve them. Black and white. 15 minutes. 35mm sound slidefilm (Class I Film) or 16mm sound motion picture (Class V Film).



**A GRAY DAY FOR O'GRADY**

O'Grady learns that accidents are very much is business. The boss shows him how a couple of recent accidents tied up his time, brought production to a near standstill and spiraled his department's costs.



## "HUMAN FACTORS IN SAFETY"

### shows supervisors how to UNDERSTAND and USE basic human traits in building a Better Safety Program

Here's how to make your supervisor a dynamic part of your program. Give them this complete film training course that shows how understanding basic human behavior and putting it to use can make Better Safety Supervisors . . . Better Production Men . . . Better Builders of Employee Morale.

Human Factors In Safety is a set of six 35mm sound slidefilms with Leader's Manual. Each film covers one important part of the complex art of handling people. They include tips on breaking in new workers, keeping experienced workers on their toes, gaining and keeping employee respect, cooperation and loyal support.

The course is entertaining, instructive, effective—a film series that will make your foremen sit up and take notice, because they all want to learn more about the fascinating subject of handling people.

Complete set includes an attractive tan leatherette carrying case. Running time of each film is 15 minutes and are Class I Films, except Safety Case Histories which is 30 minutes, and a Class III Film.



#### THE SECRET OF SUPERVISION

—sets the stage for the other five films. In story form, it illustrates why workers respond enthusiastically to one supervisor, while they resent and rebel against another. It explains that the films to follow show how to be boss and still be liked—the art of handling people.



#### TEACHING SAFETY ON THE JOB

—shows supervisors how to prepare and give job safety instructions. The four steps of good job training illustrated are: PREPARE—tell the worker what he has to learn and why; PRESENT—demonstrate how the job is done; APPLY—let the worker try it; TEST—spot check until the worker masters the job.



#### PEOPLE ARE ALL ALIKE

—explains that all normal people want the same things: a feeling of belonging to the crowd, recognition for good work, knowledge of what goes on, the ability to talk things over with the boss, and pride in their jobs. With the help of Ditsen's cartoons, the film shows how supervisors can satisfy these basic wants—get their men to work with them.



#### EVERYBODY'S DIFFERENT

—points out that while people have many things in common they also differ from one another in personality, ability and background. The film—a Bruce Shanks cartoon special—shows supervisors what allowances to make for these differences . . . how to handle the rough guy, the show-off, the loud-mouth, the day-dreamer, and the practical joker.



#### TEAMWORK FOR SAFETY

—suggests way for supervisors to make safety interesting and important to their workers. Holding stimulating meetings, encouraging suggestions from workers, using safety literature to good advantage, getting the workers to inspect for hazards . . . are some of the techniques discussed.



#### SAFETY CASE HISTORIES

—the first safety sound slide of its kind! It presents case histories of accidents that actually happened. After each, the film is stopped so the audience can discuss what caused the accident, and how it could have been prevented. This unusual way of giving the audience a chance to show what they've learned is a wonderful wind-up for a great training course.



**shows your supervisors how to put across ideas to their workers**

Supervisors and foremen are the vital link in communicating management ideas to workers. Make it easier for your men on the line to speak up for safety. Help them talk persuasively, with more confidence and conviction by showing this tested set of training films.

You don't have to be a speech training expert to put on this course. The easy-to-follow Leader's Manual provides detailed plans for a series of six meetings and practice sessions. Anyone who can thread a sound slide projector and lead an informal discussion meeting can do an effective job.

It consists of six 35mm sound slidefilms and Leader's Manual packed in an attractive leatherette carrying case with two-sided records for use with either manual or automatic projectors. Running time is 13 minutes for each film. (Class I Films).

## "SPEAKING OF SAFETY"



### THE KEY TO GOOD SPEAKING

Outlines four methods of preparing a speech, discusses the advantages and disadvantages of each, then explains which method is recommended and why. The film gives a step-by-step description of how to prepare a typical safety speech.



### ON YOUR FEET

Explains what to do physically when you get up to talk; how to stand; the purpose of moving around and how to do it effectively; what to do with your hands; where to look.



### HOW YOU'RE TALKING

Discusses the actual speech making: how loudly to talk; vocabulary, and how to phrase your ideas; your attitude—why it is important not to "talk down" to your audience... how friendliness, sincerity, and enthusiasm can make a successful speech.



### THE POWER OF SPEECH

An introduction to the films. It lists some of the occasions when foremen and supervisors may be called upon to give a speech, explains the difference between a formal speech and a working speech, and discusses their purposes.



### BUTTERFLIES IN YOUR STOMACH

Describes "that strange feeling that hits you the moment you stand up to talk," explains the physiological reactions that cause stage fright, and shows how to overcome it.



### RING THE BELL

Shows how to hold the attention of your audience from beginning to end. It explains how to "break through the ice"; the value of demonstrations, scale models or mock-ups, films and still pictures, graphs, charts, and diagrams.

## Three other speaking aids



### 1,000 SAFETY BELL RINGERS

The revised edition containing 1,000 safety slogans. Catchy phrases to use in safety talks, slogans to pep up a safety program, the right saying to help put across an idea so that it makes an impression. Slogans are divided by subjects such as fire prevention, general slogans, etc. 32 pages, 6" x 9".

### HOW TO MAKE THE SAFETY SPEECH

A handy booklet presenting the fundamentals of speech making. Shows safety men, supervisors and foremen how to put safety talks across to large and small groups. Included are chapters on how to prepare the speech, how to give the speech, contents of a good speech, and elimination of bad speech habits. 64 pages, 5 1/2" x 8 1/2".

### SPEAKING STRAIGHT—THINKING STRAIGHT

Four lectures on public speaking given at the 1946 Safety Congress by Dr. Irving J. Leo, Professor, School of Speech, Northwestern University. Discusses preparing the speech, stagefright, fluency, use of gestures, vocabulary, etc. Warns against confusing facts and assumptions. 24 pages, 5 1/2" x 8 1/2".

See Page 1 for code to abbreviations



# "SAFETY MANAGEMENT FOR FOREMEN"



## the complete Safety Training film course that makes your foremen the "SPARK-PLUGS" of your safety program

Ten 35mm sound slidefilms with Leader's Manual. Covering the fundamentals of accident prevention. They tell your foremen on safety . . . show them what and how to teach your workers . . . how a safety program is organized, the important part the foremen plays, and how the program boosts production and employee goodwill.

These are the most popular safety films ever produced! Hundreds of executives have written in to say that this series has done more than any other training aid to develop the safety knowledge and training ability of their supervisors.

The set is packed in a sturdy leatherette carrying case. Running time of each film is 20 minutes. All are Class II Films.



### RIGHT DRESS

It's up to your foremen to see that each of their workers has the right dress for his job. Every foreman should be familiar with the common types of protective equipment pictured in this film.



### DOCTOR'S ORDERS

Your workers' attitude toward first aid depends on your foremen . . . sells them on the importance and value of prompt first aid. It also discusses the value of regular physical examinations, and accident reports for every first aid case.



### BRAIN BEATS BRAWN

Improper handling of material and how to teach your foremen to prevent these injuries—and teach them the best material handling practices—gives detailed instructions on lifting and covers other material handling hazards.



### STOP, LOOK AND LISTEN

This film pictures a safety inspection committee — shows exactly what to look for when making a plant inspection. "Stop and think about safety long enough to look for unsafe conditions, and listen to safety suggestions" is their slogan.



### PRINCIPLES AND INTEREST

To sell safety to workers, your foremen must create an active interest in the subject. Discusses ways in which this can be accomplished: posters, contests, inspections, safety meetings, awards, payroll enclosures, publicity.



### PRODUCTION WITH SAFETY

"It takes less time to prevent accidents than to have them" is the theme of this film. The accident case histories presented in the film prove the point—give specific examples of how safety increases production and cuts costs.

CORRECT AND CORRECT

### FOLLOW THE LEADER

Gives a step-by-step description of how a safety program is organized—assigning safety responsibility, analyzing accident records, holding safety meetings, inspecting, guarding machinery, training employees.



### CAUSE AND CURE

Shows how to analyze an accident to determine its real causes. The film covers ten unsafe acts and eight unsafe conditions every foreman should be on the lookout for.

### GUARD DUTY

Pictures effective guards for common power machines, and points out that it's up to foremen to see that these guards are kept in place.

### SAFETY IS IN ORDER

Good housekeeping from the foreman's angle. Some points stressed are: a place for everything and insist that everything is in its place; a minimum of raw material on the floor; aisles clear; supervise piling of material; every man keeps his work area clean.

# Your foremen want and need **READY-MADE 5-MINUTE SAFETY TALKS**

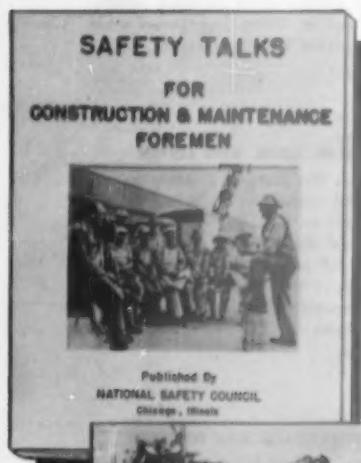
keep them

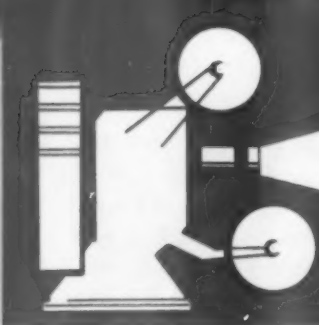
**TALKING . . . TEACHING . . . THINKING safety**  
**52 weeks of the year**

Whether it's an informal safety pep talk, a scheduled weekly training meeting, or just a routine job-instruction session with a new worker . . . 5 Minute Safety Talks equip your foremen and supervisors to do a better job. This big, ready-to-use collection of safety talks all but eliminates pre-meeting preparation.

Books 1 through 5 each contain 52 talks—each talk written by a safety man with years of experience in his field. Safety Talks for Construction and Maintenance Foremen covers 50 subjects, written by the Construction Section Executive Committee. The Public Utilities Section Executive Committee edited 30 Tailboard Talks.

While all of the 348 talks are treated as separate items in the subject index on the following pages, talks are available only in complete books.





# Safety


## TRAINING FILMS

Trainees learn as much as 55% faster, and remember up to 70% more—and longer—when films are used to help teach. This means that you can cut down new-worker safety training time, give fewer refresher courses, and still get better results by using films.

Each National Safety Council film has been carefully planned to do a specific job in your safety program—to serve as an effective discussion springboard for supervisor and worker meetings.

All fundamental and general interest films are designed to cut across industry lines. Specific industry backgrounds are minimized; emphasis is on safe practices—not environment.

### 35mm Sound Slidefilms

Most of the films described on the following pages consist of a 35mm filmstrip and a 33½ RPM recording. Many of these films are also produced in 16mm sound-motion. All 35mm sound slidefilms released since 1948 (marked with this symbol ) can be shown with either a standard projector or the new automatic 30-50 low frequency models. One side of the sound slidefilm recordings uses an inaudible signal to automatically advance each picture in synchronization with the narration.

### Previews and Rentals

Individual films and film sets may be previewed prior to purchase. Preview service charge is waived if the film is retained. The preview charge is NOT a rental fee. It is necessary to offset the Council's expense in rendering a preview service—the packing, postage and return inspection charges billed the Council by its various film producers for each shipment; replacement costs for lost or damaged films; and, the clerical and administrative cost of processing each order. Both Rental and Preview charges are per week or fraction thereof, exclusive of time in transit.

Preview and rental service is available only within the continental limits of the U.S.A. unless the member agrees to pay air-mail postage both ways. Canadian members may obtain all Council-produced films for either rental or preview from the Canadian Film Institute, 142 Sparks Street, Ottawa 4, Ontario, Canada.

### Replacements

Filmstrip or record replacements may be purchased at ¼ the price listed for the complete film if the damaged record or film is returned with the order. Otherwise cost of replacement is ½ the price listed for the complete film. Replacement footage for all 16mm motion pictures is available at laboratory cost.

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See Page 1 for code to abbreviations — See pages 66 to 69 for Index and Prices



# SAFETYGRAPHS

Safetygraphs are illustrated safety talks complete within themselves, ready for use at a moment's notice. They consist of from 12 to 16 large (18" x 24") spiral bound picture pages with a complete safety talk, instructions, questions and answers and summary. They employ the tested training method of 1) tell them, 2) show them, 3) let them try, 4) discuss the "reasons why", 5) test their knowledge, 6) review the essential points.

Give the talk as it's written, omit parts to shorten it, or stretch it out by using all the demonstrations, questions and group participation suggestions in the instructions. You'll find the SAFETYGRAPH one of the most popular and effective visual aids available for training small groups.

No.	Title	Page	No.	Title	Page
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Safety decals attached to machine frames, guards, fuse boxes and fire doors constantly remind workers to observe safe practices and follow instructions. These colorful decals conform to ASA specifications. Order by letter and number code. Available only in size 2" x 3 1/2".

The Green Cross is also available in decal form with or without the wording "Member, National Safety Council". See page 52 for complete description.

## SAFETY DECALS

*White legend on green background.*

- S-1—Sound Warning at Corners and Aisle Crossings
- S-3—Do Not Talk To or Operator
- S-4—Before Starting Be Sure Everyone Is In the Clear
- S-5—No Riders
- S-6—Keep Tools in Safe Condition and in Proper Place After Use
- S-7—Keep Floor Clean Around This Machine
- S-8—First Aid Kit

## SAFETY DECALS

- S-9—Only Authorized Persons May Change Fuses or Make Repairs
- S-10—Keep This Space Clear
- S-11—Deposit Waste Material Here
- S-13—Avoid Falls. Walk—Do Not Run—Use the Handrail
- S-14—Please Keep Your Locker Clean

### CAUTION DECALS

*Black legend on yellow background.*

- C-1—Shut Off Machine When Not in Use
- C-2—Fire Door—Do Not Block
- C-3—Shut Off Engine Before Refueling
- C-4—To Be Operated Only by Authorized Employees
- C-5—Pull and Lock Switch Before Oiling, Adjusting or Repairing Machine
- C-6—Use Brush to Remove Chips
- C-7—Stop Machine Before Making Adjustments
- C-8—Use Fuse Puller to Remove Fuses
- C-9—Do Not Operate Without Guards
- C-10—Keep Guards in Correct Adjustment
- C-13—Ground Equipment Before Use
- C-14—Do Not Use Near Electrical Equipment
- C-17—Do Not Open While Machine Is in Motion

### DANGER DECALS

*Red and black legend on white background.*

- D-1—Do Not Wear Gloves While Operating This Machine
- D-2—High Voltage

- D-4—Keep This Guard in Place
- D-6—Wear Goggles While Operating This Machine
- D-7—Flammable—Keep Flames and Heat Away
- D-8—Corrosive Liquids — Use Personal Protective Equipment
- D-9—220 Volts
- D-10—440 Volts
- D-12—No Smoking
- D-13—Wear Goggles in This Area
- D-14—Oxygen — Keep Oil and Grease Away
- D-15—Acid
- D-16—Caustic
- D-17—Replace Guard Before Using Machine

### FIRE DECALS

*White legend on red background.*

- F-1—For Wood, Paper, Textiles and Rubbish (Class A Fires) Not Electrical Equipment
- F-2—For Wood, Paper, Rubbish and Burning Liquids (Class A & B Fires) Not Electrical Equipment
- F-3—For Burning Liquids (Gasoline, Oil and Paint and Electrical Equipment) (Class B & C Fires)
- F-4—Sprinkler Valve—Do not Close Unless Authorized

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices





# LABORATORY GLASSWARE

Most laboratory accidents are caused by improper handling of glass equipment. This film shows the simple precautions to observe: wear gloves, fire-polish sharp edges, don't try to force glass into the wrong size rubber hose, loosen tube from stopper before you try to take it out, clear solvents from glassware before using, clamp equipment carefully, clean up broken glass immediately. 10 minutes. (Class I Film)

# FLAMMABLE LIQUIDS

Definitions, classification of liquids, general safety measures, health hazards, tank cars, tank trucks, storage, cleaning tanks, common uses. A reprint of Section 16—Accident Prevention Manual for Industrial Operations. 36 pages, 5 3/4" x 8 3/4".



# SPECIFIC SUBSTANCES

Acetic Acid—Data Sheet D-Chem. 29  
 Acetone—Data Sheet D-Chem. 23  
 Acetone—SIC 616  
 Ammonia—Talk 37 Book 4  
 Ammonia, Anhydrous—Data Sheet D-251  
 Ammonia, Some Hazards—SIC 372  
 Ammonium Bifluoride—SIC 528  
 Aniline—Data Sheet D-Chem. 24  
 Antimony and Its Compounds—Data Sheet D-Chem. 22  
 Arsenic and Its Compounds—Data Sheet D-297 (D-Chem. 13)  
 Asphalt—Data Sheet D-215 (D-Chem. 30)  
 Asphalt Workers—SIC 326  
 Benzene (Benzol)—Data Sheet D-Chem. 47  
 Bromine—Data Sheet D-313 (D-Chem. 21)  
 Cadmium—Data Sheet D-312 (D-Chem. 42)  
 Carbon Bisulphide—Data Sheet D-341 (D-Chem. 1)  
 Carbon Disulfide—SIC 622  
 Carbon Monoxide—Data Sheet D-Gen. 50  
 Carbon Tetrachloride—Data Sheet D-Chem. 25  
 Carbon Tetrachloride—Talk 43 Book 1  
 Carbon Tetrachloride—SIC 614  
 Caustic Soda (Sodium Hydroxide)—Data Sheet D-Chem. 2  
 Caustic Soda—Talk 36 Book 4  
 Chlorates—Data Sheet D-Chem. 8  
 Chlorine—Data Sheet D-207  
 Chlorine Containers—SIC 355  
 Chlorine Leaks (General Precautions)—SIC 379  
 Chlorine Safe Practices—SIC 345  
 Cresols—Data Sheet D-Chem. 36  
 Cyanide Compounds—SPP Chem. 6  
 Cyanide, Case Hardening with—SIC 133  
 DDT Insecticides, Use of—Data Sheet D-303 (D-F. 3)  
 Dry Ice (CO<sub>2</sub>)—Data Sheet D-Chem. 11  
 Dry Ice—SIC 417  
 Ethyl Alcohol, Industrial—Data Sheet D-Chem. 48  
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 Ethyl Ether (Diethyl Oxide)—Data Sheet D-Chem. 7  
 Ferrosilicon—Data Sheet D-Chem. 20  
 Formaldehyde—Data Sheet D-342 (D-Chem. 15)  
 Cyanides, Fumigating with—SIC 217  
 Gasoline, Using Safely—Talk 44 Book 1  
 Gasoline, Using—SIC 331  
 Hydrofluoric Acid—SIC 514  
 Hydrogen Sulphide—Data Sheet D-284 (D-Chem. 16)  
 Hydrogen Sulphide—SIC 540  
 Lime (Precautions in Handling)—SIC 421  
 Manganese—Data Sheet D-306 (D-Chem. 26)  
 Mercury—Data Sheet D-203  
 Mercury—SIC 525  
 Mercury, Fulminate of—Data Sheet D-309 (D-Chem. 40)  
 Methanol—Data Sheet D-Chem. 18  
 Methanol—SIC 615  
 Muriatic Acid (Hydrochloric Acid)—Talk 40 Book 4  
 Naphthalene (Crude and Refined)—Data Sheet D-Chem. 34  
 Nitric Acid—Talk 39 Book 4

Nitric and Mixed Acid, Fume Poisoning from—SPP Chem. 2  
 Nitrous Fumes—SIC 219  
 Nitrogen, the Oxides of—Data Sheet D-206  
 Oxalic Acid—Data Sheet D-Chem. 14  
 Oxygen, Liquid—Data Sheet D-283 (D-Chem. 50)  
 Perchloric Acid—Data Sheet D-Chem. 44  
 Phenol (Carbolic Acid)—Data Sheet D-Chem. 3  
 Phosphorus (White)—Data Sheet D-282 (D-Chem. 39)  
 Picric Acid—Data Sheet D-Chem. 28  
 Pyridine—Data Sheet D-Chem. 46  
 Sodium, Metallic—Data Sheet D-231 (D-Chem. 37)  
 Sodium, Metallic, Safe Handling of—SIC 515  
 Sulfur, Handling and Storage of—Data Sheet D-275 (D-PP 5)  
 Sulfuric Acid—Data Sheet D-Chem. 49  
 Sulfuric Acid—Talk 38 Book 4  
 Sulfuric Acid, Handling—SIC 242  
 Tetryl—Data Sheet D-218 (D-Chem. 43)  
 Tetryl, Safe Handling—SIC 537  
 Trichloroethylene—Data Sheet D-Chem. 27  
 Trichloroethylene—SIC 623  
 Trinitrotoluene (TNT)—Data Sheet D-314 (D-Chem. 38)  
 Turpentine—Data Sheet D-Chem. 12  
 Waxes, Electrical Insulating—Data Sheet D-Chem. 31  
 Xylene and Toluene—Data Sheet D-204  
 Xylene and Toluene—SIC 624  
 Weights of Materials—SIC 213  
 Zinc and Zinc Oxide—Data Sheet D-267  
 Zirconium—Data Sheet D-Chem. 45

Chemical Burns—SPP Chem. 3  
 Chemical Spills and Splashes—Safetygraph 22  
 Spills & Splashes, Acids and Caustics—Talk 15 Book 3  
 Handling of Acids—Talk 41 Book 1  
 Handling of Caustics—Talk 42 Book 1  
 Danger—Caustic—Decal D-16  
 Danger—Acid—Decal D-15

Carboys, Removing Acid from—Data Sheet D-Chem. 9  
 Carboys—SIC 224  
 Carboys, Handling—Talk 30 Book 4  
 Bottle Carrier for Corrosive Liquids—Detail Sheet 71  
 Acid Measuring, Diluting & Transfer Device—Detail Sheet 112

Pipe Lines and Tanks, Chemical, As Causes of Accidents—SPP Chem. 1  
 Pipe Lines, Acid and Caustic—SIC 117  
 Pipe Lines, Blanking Off—SIC 100  
 Tanks, Acid—SIC 293  
 Tanks, Acid, Cleaning—SIC 124  
 Tanks, Oil Storage—SIC 70  
 Tank Cars, Loading—SIC 80  
 Tank Cars, Unloading—SIC 94  
 Tank Cars, Unloading—SIC 105  
 Tank Car Dome Cover, Opening—SIC 12  
 Tank Truck Loaders—SIC 618



**STATIC SPARKS AND  
FLAMMABLE LIQUIDS**  
Safetygraph #19

It spares no punches in showing your workers how static sparks are caused, how they ignite flammable liquids, how to bond against these dangers. The information will sink in, take hold, and help every time workers transfer flammable liquids.



**CHEMICAL SPILLS AND  
SPASHES**  
Safetygraph #22

Emphasizes the dangers of liquid chemicals, their safe handling and transporting. It instructs workers to clearly identify them; how to empty drums, carboys and tank cars; what to do when chemicals are spilled, splashed on workers, or if they are overcome by chemical vapors.

Solvents (Safe Use)—SIC 674  
Solvents, Toxic, Safe Use of—Talk 47 Book 2  
Solvents, Safety, How Safe Are—Reprint 41  
Cleaning Acid Tanks—SIC 124  
Cleaning Drums Which Have Held Flammable Substances—Data Sheet D-Chem. 10  
Cleaning with Hot Water and Steam—Data Sheet Gen. 33  
Cleaning Machine Parts—SIC 137  
Removing Oil & Grease from Metal Parts—Data Sheet D-232  
Degreasing—Talk 35 Book 4  
Steam Hose—SIC 560

Flammable Liquids—Section 16 APM  
Flammable Liquids, Static Sparks and—Safetygraph 19  
Flammable Liquids—Talk 33 Book 4  
Flammable Liquids—SIC 226  
Explosive Vapors—SIC 171  
Gasoline, Using—SIC 331  
Gasoline, Using Safely—Talk 44 Book 1  
Rubber Cement, Spreading—Data Sheet D-334  
Storage Batteries—Data Sheet D-246

Spray Coating—SPP 91  
Spray Coating (Gen. Precautions)—SIC 227  
Spray Coating (Prevention of Fires)—SIC 277

Compressed Air—Talk 41 Book 3  
Compressed Air—SIC 291  
Compressed Air Hose—SIC 356  
Compressed Gases—SPP 95  
Compressed Gas Cylinders—Talk 14 Book 4  
Compressed Gas Cylinders—SIC 419  
Safe Handling of Gas Cylinders—Talk 37 Book 2  
Precautions for Monoxide and Combustible Gas—Tailboard Talk 24  
Gas Leaks—SIC 180

Chemical Laboratories—SPP 60  
Chemical Laboratories—SIC 207  
Laboratory Glassware—Film  
Handling Chemical Glassware—SIC 519  
Glass Tubing—SIC 287  
Glass Tubing—SIC H128  
Muff It—SIC H122

Heat Treating—SPP Av. 1  
Heat Treating, Nitrate-Nitrite Salt Baths for—Data Sheet D-270

Electroplating—Data Sheet D-302 (D-Gen 46)  
Magnesium Safety Board for Plating Tank Service—Detail Sheet 121

**WELDING—CUTTING—SOLDERING**

Welding and Cutting—Section 14 APM  
Welding and Cutting—Talk 41 Book 4  
Welding and Cutting—Talk 41 C & M  
Measurement and Prevention of Eye Flash, The—Reprint Const. 7  
Single Cylinder Truck (Vertebrate Type)—Detail Sheet 40  
Two-Cylinder Welding Truck—Detail Sheet 39  
Welding Screen—Detail Sheet 37  
Combination Welding Screen and Rod Supply Box—Detail Sheet 31  
Pipe Welding Shield—Detail Sheet 57  
Welding Table and Safety "V" Block—Detail Sheet 38  
Electric Arc Welders—SIC 68

Safety Clamp for K-Type Oxygen Cylinder and WK-Type Acetylene Cylinder—Detail Sheet 124  
Oxygen and Acetylene Cylinders, Storage and Use of—Talk 40 C & M

Gas Welding—SIC 99  
Oxy-Acetylene Welding—SIC 467  
Oxy-Acetylene Welding—SIC 476

**WELDING AND CUTTING**

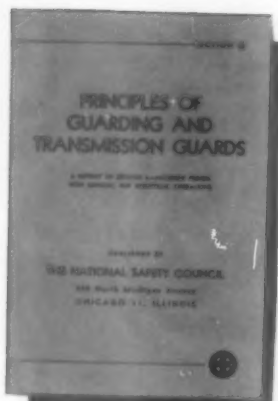
The exposures encountered in non-production line welding work, with emphasis on gas welding and flame cutting—resistance welding—are welding—common hazards. A reprint of Section 14—Accident Prevention Manual for Industrial Operations. 32 pages, 5 3/4" x 8 3/4".

Molten Lead in Caulking Operations, Precautions Taken in the Use of—Tailboard Talk 29

Soldering—SIC 164  
Soldering Etiquette and Blow Torches—Tailboard Talk 26  
Soldering Irons, Blow Torches, Lead Ports—Talk 45 Book 4

See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices



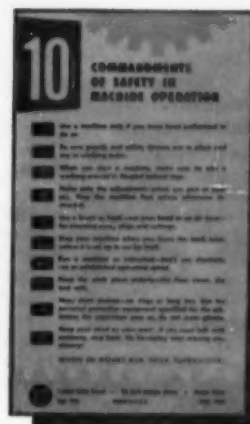


### PRINCIPLES OF GUARDING AND TRANSMISSION GUARDS

Built-in protection, general safe practices, principles of design, materials, inspections, oiling devices, rails and toe boards, prime movers and transmission equipment, starting and stopping devices, belts, shafting. A reprint of Section 6—Accident Prevention Manual for Industrial Operations. 22 pages, 5 3/4" x 8 3/4".

### 10 COMMANDMENTS OF SAFETY IN MACHINE OPERATION

An attractively designed list of the ten fundamental safety rules for machine operators. Printed in 2 colors on light card stock. Handy 4" x 7" size. With each 100 ordered, one 9 1/4" x 10 3/4" reproduction is included (free of charge) for display on shop bulletin board or another prominent place in the shop.



### GUARDING SPECIAL EQUIPMENT

Cement, quarry, ceramics, food, foundries, garment trades, ice processing, laundry and dry cleaning, meat packing, paper, printing, rubber, tanning and leather, textile. A reprint of Section 10—Accident Prevention Manual for Industrial Operations. 34 pages, 5 3/4" x 8 3/4".



### OPERATION

Machinery, Unauthorized Use of—Talk 44 Book 2  
10 Commandments of Safety in Machine Operation  
Machine Shops—SIC 299  
Mechanical Apparatus Inspection—SIC 778  
Machine Operators—SIC 306  
Do Not Talk or Distract Operator—Decal S-3  
Caution—To Be Operated Only by Authorized Employees—Decal C-4  
Before Starting Be Sure Everyone Is in the Clear—Decal S-4  
Caution—Do Not Open While Machine Is in Motion—Decal C-17  
Caution—Shut Off Machine When Not in Use—Decal C-1  
Caution—Stop Machine Before Making Adjustment—Decal C-7  
Caution—Use Brush to Remove Chips—Decal C-6  
Clearing A Jam—Talk 52 Book 5  
Plan Your Work For Set-Up Men—Talk 8 Book 4  
Caution—Shut Off Engine Before Refueling—Decal C-3



### SAFETY DEVICES AND IDEAS

90 safety devices which have been tried and found effective in plant use are presented in this book. Most of the devices were thought up and constructed by plant personnel and are not commercially available. Each is fully described and illustrated by photographs. 48 pages, 8 1/2" x 11".

### MAINTENANCE

Machinery, Care of—SIC 147  
Belts and Belt Pulleys—SIC 362  
Dressing the Belt—SIC 430  
Lacing Machine Belts—SIC 439  
Power Transmission Belt, Don'ts For—SIC 455  
Belt, Putting On a Pulley—SIC 8  
Belt, Removing Short Wide From Pulley—SIC 193  
Oilers—SIC 74  
Oiling and Repairs—Talk 40 Book 5  
Caution—Pull and Lock Switch Before Oiling, Adjusting or Repairing Machine—Decal C-5

### GUARDING

Principles of Guarding and Transmission Guards—Section 6 APM  
Guarding Special Equipment—Section 10 APM  
Safety Devices and Ideas  
Guards—Talk 36 Book 5  
Machinery Guards—SIC 150  
Machine Guarding—Talk 27 Book 1  
Guards and Interlocks—Talk 22 Book 4  
Use Guards—Talk 42 Book 2  
Caution—Keep Guard in Correct Adjustment—Decal C-10  
Keep Guards in Place—Talk 28 Book 1  
Danger—Keep This Guard in Place—Decal D-4  
Caution—Do Not Operate Without Guards—Decal C-9  
Always Replace Guards—Talk 41 Book 2  
Danger—Replace Guard Before Using Machine—Decal D-17

An extremely comprehensive book for supervisors dealing with all types of woodworkings jigs and fixtures. Complete description of the various kinds of jigs and fixtures with precise instructions on how to build and use them. 61 excellent drawings. 104 pages, 8 1/2" x 11".



# WOODWORKING MACHINERY

Saws: circular, overhead swing, straight line pull cutoff, underslung cutoff, radial variety, power feed rip saws, band; circular saw blade maintenance, jointers, power feed planers, woodworking lather, combination machines, sanders, miscellaneous woodworking machines. A reprint of Section 9—Accident Prevention Manual for Industrial Operations. 19 pages, 5 3/4" x 8 3/4".



## WOODWORKING MACHINES

Covers all phases of safety in woodshop work from guards and machine operation to housekeeping and eye protection. Gus, an old, safety-wise woodworker, takes two new safety committee recruits on a machine-by-machine tour of the plant. With actual demonstrations, he shows them the importance of guards; how they work, as well as the safe practices to follow in using saws, splitters, jointers, shapers, and planers. 17 minutes. (Class I Film)

## WOODWORKING

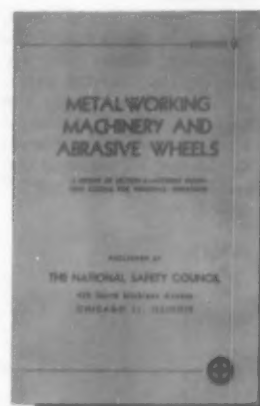
Woodworking Machinery—Section 9 APM  
Woodworking Machines—Film  
Jig and Fixture Design for Woodworking Safety—Book  
Boring Machines, Wood, and Hollow Chisel Mortisers—Data Sheet D-229 (D-W 6)  
Boring Machines, Wood—SIC 473  
Feather Board—Detail Sheet 146  
Jointers, Wood—Data Sheet D-W 4  
Jointers, Wood—Talk 35 Book 1  
Jointers, Wood—SIC 427  
Jointer Guard—Detail Sheet 103  
Jointers and Circular Saws, Push Tools for—SIC 38  
Lathes, Wood Turning—Data Sheet D-W 9  
Planers, Wood, Power Feed—Data Sheet D-225 (D-W 8)  
Planers, Wood—Talk 36 Book 1  
Planer Operators, Wood—SIC 452  
Sanders, Wood—Data Sheet D-338  
Saws, Band, Woodworking—Data Sheet D-235 (D-W 5)  
Saws, Band, Wood—SIC 437  
Saws, Band—Talk 38 Book 1  
Saw, Band, Guard for Point of Operation—Detail Sheet 101  
Saw Guards, Circular Rip—Data Sheet D-W 1  
Saw, Guard, Circular—Detail Sheet 25  
Saws, Circular—SIC 254  
Saws, Circular Table—SIC 54  
Saw Guards, Cross-Cut—Data Sheet D-226 (D-W 2)  
Saws, Table—Talk 24 Book 4  
Saws, Power Feed Rip—Talk 37 Book 1  
Saws, Radial—SIC 718  
Saws, Overhead Swing Cut-Off—Data Sheet D-277 (D-W 11)  
Saws, Overhead Swing and Straight Line Pull Saws—Talk 25 Book 4  
Saw, Swing Cut-Off—SIC 143  
Shapers, Wood—Data Sheet D-W 3  
Shapers, Wood—SIC 403  
Stickers, Molders and Notchers, Wood—Data Sheet D-W 10

## METAL WORKING

Boring Mills, Vertical Metal—Data Sheet D-Me. 8  
Boring Mills, Horizontal Metal—Data Sheet D-269 (D-Me. 6)  
Drill Presses, Metal-Working—Data Sheet D-Me. 4  
Gear-Hobbing Machines—Data Sheet D-Me. 23  
Drill Presses—Talk 29 Book 1  
Drill Press Operators—SIC 87  
Milling Machines, Metal-Working—Data Sheet D-Me. 3  
Milling Machine Operators—SIC 297  
Lathes, Engine—Data Sheet D-Me. 13  
Lathe Operation, Metal—SIC 89  
Lathes—Talk 28 Book 4  
Planers, Metal—Talk 31 Book 1  
Planers, Metal—Data Sheet D-Me. 2  
Planer, Metal, Operators—SIC 298  
Metal Brakes—Talk 34 Book 1  
Saws (Cold) Metal—Data Sheet D-Me. 11  
Shapers, Metal—Talk 30 Book 1  
Shapers, Metal—Data Sheet D-216 (D-Me. 5)  
Shears, Alligator—Data Sheet D-213 (D-Me. 20)  
Shear, Alligator, Chip Guard for Blade of—Detail Sheet 140  
Shears, Metal Squaring—Data Sheet Me. 9  
Slotters, Metal—Data Sheet D-Me. 7

## METALWORKING MACHINERY AND ABRASIVE WHEELS

How to make machine tools, metal saws, spinning lathes, abrasive wheels mechanically safe. A reprint of Section 8—Accident Prevention Manual for Industrial Operations. 28 pages, 5 3/4" x 8 3/4".



## BENCH AND STAND GRINDERS

Safetygraph #2

Discusses eye protection around grinders; spacing for work rests; work pressure; exploding wheels; over-heating; checking for damage; checking speed ratings when changing wheels; ring-testing for defects; hood adjustments; dressing wheels; excessive vibration.

## ABRASIVE WHEELS AND GRINDERS

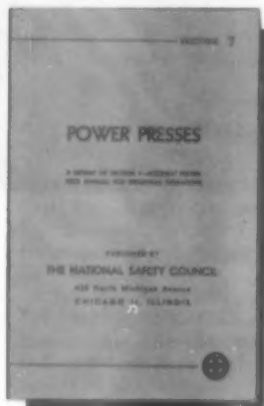
Abrasive Wheels and Metalworking Machinery—Section 8 APM  
Abrasive Stand Grinders—Talk 33 Book 1  
Bench Grinders—Talk 26 Book 4  
Bench and Stand Grinders—Safetygraph 2  
Bench and Stand Grinders—SIC 102  
Bench and Stand Grinders—SIC 589

(Continued next page)

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Grinder Check List—SIC 776  
Grindstones—SIC 551  
Grinding Wheels, Safe Use of—Talk 43 Book 2  
Grinding Wheel Flange, Dimensions—SIC 81  
Grinding Wheel Flange Dimensions—SIC 66  
Grinding Wheel Flange Dimensions—SIC 59  
Grinding Wheels, Handling and Storage—SIC 286  
Grinding Wheels, Mounting on Spindles—SIC 50  
Grinding Wheels, Making the Ring Test—SIC 108



## POWER PRESSES

Guards, primary operations, secondary operations, auxiliary devices, hydraulic and air presses, foot (kick) and hand presses, setup, inspection and maintenance, forging and hot metal stamping, metal shears, press brakes. A reprint of Section 7—Accident Prevention Manual for Industrial Operations. 35 pages, 3 3/4" x 8 3/4".

## POWER PRESS AND FORGING

Power Presses—Section 7 APM  
Power Presses, Inspection and Maintenance of—Data Sheet D224 (D-Me. 18)  
Power Press, Operating A—Safetygraph 3  
Power Press Inspection—SIC 506  
Power Press Operators—SIC 65  
Punch Press Guards—SIC 307  
Punch Presses—Talk 32 Book 1  
Punch Presses, Handling Finished Pieces at—Data Sheet D-Me. 25  
Punch Presses, Scrap Handling—Data Sheet D-Me. 22  
Kick-Type Presses—Data Sheet D-Me. 19  
Power Press Dies, Setting Up and Removing—Data Sheet D-211 (D-Me. 16)  
Die Guards, Individual and Adjustable Press Barriers—Data Sheet D-Me. 27  
Die Setters—SIC 350  
Forging and Hot Metal Stamping—SPP 85  
Drop Hammers and Drop Forges—Data Sheet D-Me. 10  
Drop Hammers, Rope—Data Sheet D-217 (D-Me. 17)  
Hammers, Power—SIC 317  
Die Setters (Drop Hammers)—SIC 505  
Power Brakes Treadle Stop—Detail Sheet 56  
Press Brakes—Data Sheet D-Me. 28  
Press Brakes—Talk 27 Book 4



## OPERATING A POWER PRESS

Safetygraph #3

Emphasizes guarding—types of guards, and why the operator should use them. Also discussed are: use of sticks to remove pieces that are caught; special tools to insert and remove work; preventing damage to dies; proper dress; handling stock parts.

## OTHER MACHINERY

Baling Presses—Data Sheet D-PP 7  
Banbury Operators—SIC 595  
Babbitt Bearings—Data Sheet D-Me. 24  
Buffing and Polishing—SIC 482  
Calenders (Safe Operation)—SIC 593  
Calenders (General Precautions)—SIC 592  
Calender Rolls, Handling—Data Sheet D-PP 2  
Calender Rolls, Device for Loading on Hand Trucks—Detail Sheet 119  
Cameron Winder, Nip Guard on—Detail Sheet 69  
Chipper Knives, Handling—SIC 708  
Compressors, Air, and Air Receivers, Cleaning—Data Sheet D-Me. 14  
Compressed Air Machinery and Equipment—SPP 47  
Corrugators—Data Sheet D-356  
Cylinder Head Lifter, Horizontal Engine—Detail Sheet 117  
Die Casting Machine, Safe Operation—SIC 577  
Die Casting Machines—Data Sheet D-Me. 21  
Extruding Machines (General Precautions)—SIC 596  
Extruding Machines (Operating Rules)—SIC 597  
Flywheels—SIC 283  
Gas Engines, Cranking—Talk 49 Book 1  
Gas Engines, Cranking—SIC 190  
Guillotine Cutters, Power—Data Sheet D-298 (D-PP 3)  
Guillotine Paper Cutter—SIC 465  
Guillotine Knives, Changing—SIC 576  
Hydraulic Filter Press (Operation)—SIC 689  
Hydro-Extractors—Data Sheet D-Gen. 9  
Machinery, Heavy, Dolly for Moving—Detail Sheet 59  
Machinery, Skidding and Blocking—Talk 29 Book 4  
Master Roll Safety Release—Detail Sheet 137  
Reel Guard on Felt or Paper Machine—Detail Sheet 92  
Shift Bar Safety Lock—Detail Sheet 85  
Trimmer, Safety Stop on—Detail Sheet 122  
Tumbling Barrels—Data Sheet D-Gen. 18  
Winders, Paper Tube—Data Sheet D-354  
Winder Shaft Dolly—Detail Sheet 70  
Winder Guard—Detail Sheet 100  
Winder Guards, Two—Detail Sheet 89  
Wire Drawing Operations—SIC 484

## ELECTRICITY

Electrical Hazards, Scientific Facts Concerning—Reprint Gen. 4  
Electricity on the Job—Talk 35 C & M  
Electrical Hazards—Section 15 APM  
Electrical Hazards—Safetygraph 12  
Electrician, Plant—SIC 128  
Electricity for Non-Electricians—Talk 35 Book 5  
Copper Conductors, Safe Carrying Capacities for—SIC 13  
Extension Cords—Talk 44 Book 4

Extension Cords, Electrical—Data Sheet D-Gen. 21  
Extension Light Cords and Systems, Low Voltage—Data Sheet D-Gen. 47  
Extension Cords, Fastening Plugs to—SIC 26  
Underwriter's Knot—SIC 9  
Floodlight Tower, Portable—Detail Sheet 41  
Fuses (Industrial Plant Motor and Lighting Circuits)—SIC 274  
Fuse Boxes—Talk 43 Book 4



## ELECTRICAL HAZARDS

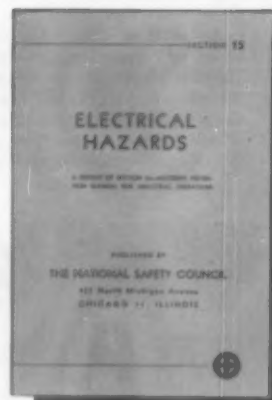
Safetygraph #12

Sums up important points to remember about electricity and electrical equipment. 1. Use good equipment. 2. Don't overload circuits. 3. Keep away from live conductors. 4. Ground an electrical tool before use. Discusses the common causes of electrical burns and injuries.

Fuses (Only Authorized Persons May Change Fuses or Make Repairs)—Decal 5-9  
Fuses (Caution—Use Fuse Puller to Remove Fuses)—Decal C-8  
Ground Electrical Equipment—Talk 48 Book 2  
Caution—Ground Equipment before Use—Decal D-13  
Caution—Do Not Use Near Electrical Equipment—Decal D-14  
Ladders, Aluminum and Other Metal—Reprint Gen. 7  
Lamps, Fluorescent, Disposal of—Data Sheet D-Gen. 36  
Lamps, Portable Extension—SIC 67  
Emergency Lighting—Data Sheet D-248  
Lightning and How to Dodge It—Reprint Gen. 6  
Lightning—SIC 397  
Radio Frequency Heating—Data Sheet D-319  
Receptacles, Electrical Test Unit for—Detail Sheet 123  
Switch, Before You Throw That—Talk 45 Book 5  
Switches, Disconnecting—SIC 612

## ELECTRICAL HAZARDS

Electrical injury, equipment selection and installation, switches, fuses and breakers, control equipment, grounding, explosion-proof fittings, extension cords, equipment for testing, inspection practices, specialized equipment, motors, motor maintenance. A reprint of Section 15—Accident Prevention Manual for Industrial Operations. 26 pages, 5 3/4" x 8 3/4".



Switches, Disconnecting—SIC 611  
Switches, Disconnecting—SIC 613  
Switches, Methods of Locking Out Electric—Data Sheet D-237 (D-Gen. 41)  
Switches, Operating Enclosed Electric—SIC 60  
Switch, Oil, Model for Demonstration—Detail Sheet 130  
Switches, Safety Handle for Operating—Detail Sheet 73  
Wires and Cables, High Voltage Testing of Insulated—Data Sheet D-EE 3  
Cable, Safety Tongs for Handling High Voltage—Detail Sheet 33  
Volts and Jolts—Reprint 54  
110 Volt Electricity—Talk 40 Book 3  
Danger—220 Volts—Decal D-9  
Danger—440 Volts—Decal D-10  
Danger—High Voltage—Decal D-2  
Shock Proofing—SIC 813

# TOOLS—HAND AND PORTABLE POWER



## SAFE IN HAND

Consists of two parts. Part I, Machinists' Tools, shows how to pick the right tool for the job; how to use each safely. Covers all the common hand tools. Part II, Maintenance Tools, discusses the heavier tools used by plant maintenance crews. 12 minutes for each part. (Class I Film)

## HAND AND PORTABLE POWER TOOLS

Purchase and control, maintenance and repair, use of metal cutting tools, use of wood cutting tools, misc. cutting tools, material handling tools, torsion tools, shock tools, nonsparking tools, portable power tools, electric tools, air power tools, special power tools. A reprint of Section 13—Accident Prevention Manual for Industrial Operations. 25 pages, 5 3/4" x 8 3/4".



## FOR SAFETY SAKE

An excellent training film for all workers that use portable power tools. Shows how to use, inspect and maintain drills, grinders, saws and other electric hand tools with emphasis on the basic safety precautions. 15 minutes, 16mm motion picture. (Class V Film).



## RULES FOR TOOLS

Dramatizes safe practices in the use of small hand tools. Explains the four basic rules: select the right tool, be sure it's in good condition, use it properly, and put it away safely. 20 minutes. Black and white. 35mm sound slidefilm (Class I Film).



**COMMON HAND TOOLS**  
Safetygraph #9

Shows how to avoid hand and finger injuries caused by hammers, wrenches, chisels, knives, files, and screw drivers. The four ways to prevent hand tool accidents are: use the right tool; use a tool in good condition; use it the right way; keep in a safe place.

**TOOLS—HAND AND PORTABLE POWER**

Hand and Portable Power Tools—Section 13 APM  
Carry Tools Safely—Talk 50 Book 2  
Tool Keepers—SIC 136  
Maintenance Tools—Photocrypt  
Rules for Tools—Film  
For Safety's Sake—Film  
Bad Tools—Talk 51 Book 5  
Common Hand Tools—Safetygraph 9  
Machinist Hand Tools—Photocrypt  
Safe in Hand—Film  
Hand Tools—Accident Preventer 501  
Hand Tools—Tailboard Talk 8  
Hand Tools, Four Rules for—Talk 26 Book 3  
Hand Tools—Talk 36 C & M  
Hand Tools (Check List for Safe Use)—SIC 774  
Hand Tools (Inspection Check List)—SIC 772  
Hand Tools—SIC 85  
Hand Tools, Sharpening—SIC 192  
It's In Your Hands—Talk 30 Book 5  
Axe Heads—SIC 588  
Axes—SIC 191  
Chisels—Talk 28 Book 3  
Chisel Bar Holder—Detail Sheet 64  
Chisels, Bull—SIC 389  
Chisel, Cold, Cautions—SIC 483  
Files—SIC 174  
Nail and Hammer Hazards—Talk 10 C & M  
Hand Hammer Hints—SIC 31  
Dressing Hammer Struck Tools—Talk 49 Book 2  
Safe-Ending Impact Tools—Data Sheet D-Gen. 31  
Knives—Talk 30 Book 3  
Hand Knives—Data Sheet D-369 (D-Gen. 30)  
Logging and Lumbering Hand Tools—SIC 453  
Picks—SIC 176  
Bow Saws—SIC 669  
Hand Saw, Using A—SIC 255  
Screw Drivers—Talk 27 Book 3

**FOUR PRINCIPLES OF HAND TOOL SAFETY**

Accident Preventer 501, explains the importance of selecting the right tool for the right job, condition and maintenance of tools and the storing of them in a safe place, ready for use. 2-color. 4 pages, 3" x 5".



Sheathes for Sharp Pointed Tools—SIC 184  
Tree Felling and Stump Removal—Talk 46 C & M  
Wrenches—Talk 29 Book 3  
Wrenches—SIC 111  
Pipe Wrenches—SIC 188  
Whetstones—SIC 552

Electric Hand Tools—SIC 343  
Portable Electric Tools—SIC 773  
Portable Electric Tools—SIC 91  
Portable Power Tools—Talk 48 Book 1  
Portable Electric Tools—Talk 37 C & M  
Pneumatic Hand Tools—SIC 52  
Power Actuated Hand Tools—Data Sheet D-236  
Pneumatic Can Opener—Detail Sheet 30  
Explosive Wedges or Guns (General Precautions)—SIC 711  
Explosive Wedges or Guns (Handling Explosives)—SIC 710  
Explosive Wedges or Guns (Preparations for Firing)—SIC 709  
Explosive Splitting Wedges or Guns—Data Sheet D-321  
Portable Electric Drills—Talk 32 Book 3  
Flexible Shaft Tools (Inspection)—SIC 621  
Flexible Shaft Tools (Use)—SIC 620  
Flexible Shaft Tools—Data Sheet D-Me. 26  
Portable Electric Grinding Wheels—Talk 33 Book 3  
Portable Electric Tools, Grounding of—Talk 38 C & M  
Portable Electric Equipment, Grounding of—Data Sheet D-299 (D-Gen. 42)  
Portable Power Tools, Grounding—Talk 31 Book 3  
Portable Power Hammers—SIC 363  
Electric Hand Saws—Data Sheet D-Gen. 49  
One-Man Power Chain Saws—SIC 784  
Power Chain Saw Operators—SIC 785  
Bucking With Power Chain Saws—SIC 783  
Power Chain Saws—SIC 671  
Portable Power Chain Saws—Data Sheet D-320  
Radial Saw—Data Sheet D-353



**MAINTENANCE TOOLS**

Drives home the A B C's of handling tools. It shows how to prevent accidents by using them correctly, keeping them in good condition, and in the proper place. Photocrypt. 16 pages, 3 1/2" x 6".

**MACHINISTS HAND TOOLS**

Presents four easily-followed rules for eliminating hand tool accidents: 1. The right tool; 2. In good condition; 3. Used correctly; 4. Kept in a safe place. Photocrypt. 16 pages, 3 1/2" x 6".



See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices

# CONSTRUCTION—DEMOLITION—REPAIR



## MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION

Especially written by the Associated General Contractors of America for construction superintendents and foremen. Illustrates the safe way of performing construction jobs, emphasizes the costly results of unsafe practices. Newly added sections on welding, power saws, flammable gases, etc., drawings and charts. 258 pages, 6 1/4" x 9 1/4".

## CONSTRUCTION, DEMOLITION, REPAIR

AGC Manual of Accident Prevention in Construction  
Construction and Demolition—Chapter 2 APM (1st Edition)  
Safe Builder—Booklet  
Construction Poster Sets  
Building Construction—SPP Const. 1  
Why Accident Prevention on Construction Work?—Talk 1 C & M  
Principles of Accident Prevention on Construction Work—Talk 2 C & M  
Building Construction Safety—Film  
What Does It Cost—How Much Does It Save?—Reprint 51  
Why Accident Prevention in the Construction Industry?—Illustrated Talk 1  
Keeping Your Construction Equipment Safe—Reprint Const. 9



## WHY ACCIDENT PREVENTION IN THE CONSTRUCTION INDUSTRY?

Illustrated Safety Talk #1

Uses full page illustrations to show how construction and related industry accidents can be avoided. Remarks for leader appear on reverse side of each page. Covers basic rules for safety such as planning safety rules for each operation, avoiding chance-taking, teamwork, and reporting unsafe conditions. Essel-type binder, 11" x 14".

## CONCRETE

Cement—Talk 15 C & M  
Concrete, Safe Handling and Placing of, The—Reprint Const. 8  
Concrete Mixers and Pavers—Data Sheet D-255  
Concrete, Mixing and Placing—Talk 53 C & M  
Concrete Pavers, Safety Guards on—Detail Sheet 135  
Concrete Mixers (Operation)—SIC 698  
Concrete Mixers (Maintenance)—SIC 699  
Concreting—Form Building and Erection—Talk 52 C & M  
Form Stripping—Talk 54 C & M

## CONSTRUCTION AND DEMOLITION

Demolition of buildings, excavation, hoists, cranes and derricks, miscellaneous machinery and equipment, welding and cutting, railings and toeboards, ramps, stairways and ladders, scaffolds and staging, steel erection, salamanders. A reprint of Part II—First edition—Accident Prevention Manual for Industrial Operations. 42 pages, 6" x 9".

## THE SAFE BUILDER

Here's the construction industry's own employee monthly magazine—aimed at the specific hazards, unsafe practices and attitudes peculiar to the industry and its workers. 8 pages, 3 3/8" x 5 7/8".



Sheet Piling—SIC 462  
Excavation—Talk 48 C & M  
Excavation Work—SPP Const. 3  
Excavation Workers—SIC 322  
Trench Excavation—Data Sheet D-254  
Trench Excavation—Talk 50 C & M  
Trenches, Working in—SIC 504  
Making a Safe Spoil Bank—Tailboard Talk 30  
Safe Working Heights for Earth Embankments—Reprint Const. 3  
Hand Shovel and Spade—SIC 440

Placing of Reinforcing Steel—Talk 55 C & M  
Steel Erection—Talk 56 C & M  
Organizing a Steel Erection Job for Safety—Reprint Const. 4  
Riveting—SIC 458  
Rivet Scaffolds—Detail Sheet 34

Jackhammer Devices for Starting Holes—Detail Sheet 42  
Pile Driving—Talk 58 C & M  
Pile Driving—SPP Const. 4

Barricades—Talk 4 C & M  
Barricades and Warning Devices for Highway Construction Work—Data Sheet D-239  
Fence Barricade—Detail Sheet 22  
Horse Barricades—Detail Sheet 21  
Protection to the Public—Talk 3 C & M  
Public Protection Around Open Excavations—Tailboard Talk 27  
Protection of the Public—Streets, Highways, Open Areas—Tailboard Talk 28  
Protecting Public Utility Employees on Streets and Highways—SPP P. U. 1  
Traffic Hazards Around Street Openings—Tailboard Talk 19  
Ramps and Runways—Talk 47 C & M



## BUILDING CONSTRUCTION SAFETY

Aimed directly at the old superstition that each story of a building is paid for with the life of a worker. Covers demolition, steel scaffolding, ladders, unguarded floor openings, concrete placement, material hoists, housekeeping and other factors. 36 frames. Black and white. 35mm silent slidefilm Class II Film).

See Page 1 for code to abbreviations

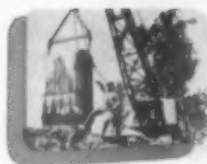


Falls—Talk 33 C & M  
 Felling Objects—Talk 34 C & M  
 Portable First-Aid Station—Detail Sheet 18  
 Infirmary for Construction Projects—Detail Sheet 17  
 Material Moist—Talk 21 C & M  
 Sidewalk Shed—Detail Sheet 26  
 Sidewalk Sheds—Data Sheet D-Const. 5  
 Fire Hazards—Talk 8 C & M  
 Brush Cleaning and Burning—Talk 45 C & M  
 Purging—Tailboard Talk 20  
 Hot Metal or Wax, Safe Handling of—Tailboard Talk 25  
 Section Tool House, Interior Arrangement of—Detail Sheet 54  
 Safety Rack for Tools—Detail Sheet 24  
 Safety Hooks for Iron Workers—Detail Sheet 44  
 Wheelbarrows, Use of—Talk 51 C & M  
 Wheelbarrows—SIC 187

Bricks—SIC 243  
 Stone Masons—SIC 220  
 The Highway Engineer is a Safety Man—Reprint Const. 11  
 Center Stripping of Highways & Municipal and Industrial Plant Roadways—Data Sheet D-221  
 Street and Highway Surfacing—SIC 475  
 Highway Flagmen—SIC 501

Demolition—Removal of Materials—Talk 44 C & M  
 Demolition of Structures—SPP Const. 5  
 Demolition—Wrecking by Hand—Talk 43 C & M  
 Blasting Operations—Talk 57 C & M  
 Building Wreckers—SIC 301  
 5 Minute Talks for Construction and Maintenance Foremen—For full description, see page 18

## MOTORIZED EQUIPMENT



### CONSTRUCTION EQUIPMENT SAFETY

A dozen common mistakes account for three out of four accidents with construction equipment. Among the safety rules covered are: keep equipment a safe distance from power lines, make sure everyone is clear before you move machinery, block suspended parts before repairing or moving. A must film for all tractor, crane, dragline, shovel, and truck users. 20 minutes. (Class I Film)

### MOTORIZED EQUIPMENT

Watch Out For Wires—Leaflet  
 Loading and Dumping—Talk 49 C & M  
 Transporting Men by Truck—Talk 42 C & M  
 Transportation of Men by Truck—Tailboard Talk 7  
 Moving Heavy Equipment and Machinery—Talk 17 C & M  
 Construction Equipment Safety—Film  
 Heavy Duty Equipment on Construction Jobs, Safe Use of—Reprint Const. 10  
 Bulldozers, Prevention of Accidents in Use of—Reprint Const. 1  
 Bulldozers and Tractors—Talk 18 C & M  
 Derricks and Winches, Care and Use of—Tailboard Talk 12  
 Motor Graders, Bulldozers and Scrapers—Data Sheet D-256  
 Shovels, Cranes and Draglines—Talk 16 C & M  
 Shovels, Cranes and Draglines—Illustrated Talk 2  
 Electric Shovels, Cranes and Other Mobile Equipment, Grounding—Data Sheet D-287  
 Power Shovels, Draglines, and Similar Equipment, Operation of—Data Sheet D-271  
 Power Shovels, Draglines, etc. (Operation)—SIC 696  
 Crane Contacts Kill—Leaflet  
 Crane Stickers



### SHOVELS, CRANES AND DRAGLINES

Illustrated Safety Talk #2

Designed especially for construction workers, this talk primarily covers accidents involving shovels, cranes and draglines. Discusses eight of the most predominant unsafe practices or conditions which cause general construction equipment accidents. Forcefully illustrates the safe operation of heavy mechanical equipment. Easel-type binder, spiral bound, 11" x 14".



### OPERATING HEAVY DUTY TRUCKS SAFELY

Training film covering the highly specialized operation of heavy earth-moving trucks. Filmed on-the-job, it covers the hazards operators will encounter; safe practices in driving, dumping, towing, and loading. Suitable for construction companies, quarries, and all types of open-pit operations. 12 minutes. (Class I Film)

Crane Rail Stop—Detail Sheet 46  
 Crane Rail Stop, Temporary—Detail Sheet 45  
 Crane Wheel Guard—Detail Sheet 47  
 Skull Crackers (Yard Drops)—Data Sheet D-268  
 Motor Trucks for Mines, Quarries and Construction—Data Sheet D-Gen. 26  
 Heavy Duty Trucks, Operating Safely—Film  
 Tool Box Fasteners on Truck Beds—Detail Sheet 43  
 Dump Truck Safety Block—Detail Sheet 5  
 Dump Truck Cab Protector—Detail Sheet 19  
 Dump Truck Safety Prop—Detail Sheet 20  
 Opposite Side Tripping Device for Bunk Stakes—Detail Sheet 141  
 Bench Seat for Pickup Trucks, Removable—Detail Sheet 4  
 Hinged Seats—Detail Sheet 16  
 Dump Truck Plank Seats—Detail Sheet 27  
 Plank Seats for Stake Body Trucks—Detail Sheet 15  
 Plank Seats for Pickup Trucks, Removable—Detail Sheet 14  
 Tire Safety Rack—Detail Sheet 3  
 Heavy-Duty Tow Bar—Detail Sheet 143  
 Lock Rim Holding Device—Detail Sheet 120  
 Mechanical and Hydraulic Jacks—Tailboard Talk 11  
 Canopy for TD9 and D4 Tractors—Detail Sheet 126



### CRANE STICKERS

An excellent reminder for rig operators to be careful not to hit high voltage power lines. This oversize (4" x 7") sticker should be mounted inside every cab where it can constantly be seen. Pressure-sensitive backing makes it easy to apply in a matter of seconds.

# complete MOTOR TRANSPORTATION Service..

A simple and practical program for developing safe drivers by:

- ★ Inspiring the "WANT-TO" for safe driving
- ★ providing the reminder materials needed in building that all-important **SAFE DRIVING ATTITUDE**
- ★ supplying the information needed to administer a sound driver safety program



## FLEET SAFETY MANUAL

Shows how to organize and conduct an effective safety program. It consists of eight comprehensive parts and supplementary material in a rich maroon loose-leaf binder. The sections cover: The Fleet Program; Selection of Drivers; Driver Training; Accident Reports and Records; National Fleet Safety Contest Rules; Safe Driver Award Rules; Garage and Repair Shop Safety; The Accident Review Committee and a set of Fleet Safety Memos.

## PUBLIC SAFETY MAGAZINE

... the best single source of up-to-the-minute information in the traffic safety field. Its 40 or more pages feature stimulating articles by fleet and traffic safety experts, current accident statistics, news of accident prevention activities, and reviews of new safety publications.



## the nation's highest award for professional safe driving performance

The National Safety Council Safe Driver Award is the HEART of the service. Your drivers will value this award because it is a credential recognized from coast to coast—proof of safe driving ability to management and to other drivers—the national emblem of expert professional drivers. You may give a Safe Driver Award and certificate to each qualified driver as soon as you enroll, or at any other time during the year. You have a choice of three styles—cap, keychain or lapel—in heavy gold plate and blue hard-fired jeweler's enamel.

## POSTER SETS—AUTOMATIC SERVICE

Colorful, convincing reminders of the ideas behind the professional safe driving code, that sell "safe operation" every day. The service is automatic—sets are keyed to operations and subjects reflect accident causing factors, each set consisting of four different posters—two large (17" x 23") and two small (8 1/2" x 11 1/2"), mailed each month for a year.

# ...an effective and integrated program for drivers



## THE SAFE DRIVER MAGAZINE

... the safety salesman that works wonders with those who've been told and TOLD—but haven't been SOLD. Common-sense safety squibs sprinkled with humor, and lots of cartoons, make good reading. Before they know it, your drivers will be induced to accept responsibility for equipment, start forming good driving habits, become sold on the personal benefits of safe driving. Monthly copies of the Truck, Bus, or Salesman (passenger car) editions are provided for each driver—imprinted with your company name on the front cover if you wish.



TRUCK



BUS



SALESMAN



## FOR EXPERTS ONLY

... a brochure given to each of your drivers, explains the rules governing the Safe Driver Award, and shows them how they can win it and keep on winning it year after year. It shows them how they will benefit personally by winning the award—makes them want to qualify. And it clearly explains the principles of defensive driving ... the standard code of professional safe driving.

## DRIVER LETTERS

... discussing a single safety topic of interest to professional drivers in each monthly issue—written in the language they use and believe. Subject matter is aimed at the normal high frequency and high severity accident causes, with seasonal hazards also coming in for their share of attention. They do important missionary work on the home grounds when you mail them to your drivers. Truck, Bus, or Salesman editions are provided for each driver.

## NATIONAL FLEET SAFETY CONTEST

Promotional material—a monthly bulletin, a colorful poster and contest entry privileges. \$3.00 per fleet. Note: this subscription service is provided at no charge for a fleet entered in the contest which subscribes to an Administrative Unit with primary registration in either Commercial Vehicle or Transit Sections.

Accident Reports and Records—Part 4\*  
Contest Rules, National Fleet Safety Contest—Part 5\*

Driver Training—Part 3\*  
Fleet Safety Program, The—Part 1\*  
Garage and Repair Shop Safety—Part 7\*  
Lock Rim Holding Device—Detail Sheet 120

Mechanical and Hydraulic Jacks—Tailboard Talk 11

Safe Driver Award Rules—Part 6\*  
Selection of Drivers—Part 2\*

\* Parts of Fleet Safety Manual

## ANNUAL DUES

Complete service is available at prices shown in box below. Insurance and Industrial organizations write for appropriate prices.

No. of Drivers	Cost per Driver
1 to 9	\$30.00
(per fleet, minimum charge)	
10 to 19	3.20
20 to 29	2.70
30 to 49	2.20
50 to 74	2.00
75 to 99	1.85
100 to 199	1.60
200 to 399	1.45
400 to 699	1.35
700 to 999	1.30
1000 to 1999	1.20
2000 or more	1.15

## SERVICE TABLE

Number of Drivers	1 to 9	10 to 49	50 to 99	100 or more
1. Fleet Manual, as issued (large)	—	1	1	1
Fleet Manual, as issued (small)	1	—	—	—
2. Automatic Posters				
No. of 8½x11½-inch posters, monthly	2	2	4	8
No. of 17x23-inch posters, monthly	2	2	4	8
3. Public Safety Magazine, monthly	1	1	1	1
4. Sectional Enrollment				
No. of Sections	1	2	2	2
5. Sectional News Letters				
No. of Copies, monthly	1	2	2	2
6. Accident Facts, annually	0	1	1	1
7. Accident Rates Pamphlet, annually	0	1	1	1
8. Congress Transactions, annually				
General	1	1	1	1
Section Meetings	1	2	2	2
9. National Safety Calendar	1	1	1	1
10. Safe Driver Magazine	One Monthly Copy for Each Driver			
11. Safe Driver Awards	One annually for Each Eligible Driver			
12. For Experts Only (Award Rules)	One copy for each Driver this year and one copy for every 5 Drivers in subsequent years			
13. Driver's Letter, Monthly	One Monthly Copy for Each Driver			
14. Participation in the National Fleet Safety Contest	Contest begins July 1 each year and runs to June 30 of following year			

The items of service shown here may be varied from time to time by the National Safety Council to give the best service currently available.

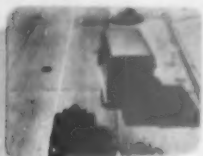
Other Membership Services and Privileges include Consultation and Library Service; Participation in Sectional Activities and National Safety Congress; Speakers Bureau; Employment Bureau.



## SMOOTH OPERATION

Driving a truck in city traffic needn't be a nerve-fraying ordeal. The secret is smooth operation—the skillful coordination of driver,

vehicle and traffic. Sudden stops, starts and turns are apt to catch other drivers off guard. Make your moves g-r-a-d-u-a-l-l-y after proper signaling and a quick check of the rear view mirror. A sportsmanlike attitude leaves you relaxed and smiling at the end of the day. 16 minutes. [Class I Film]. Also 16mm motion version [Class V Film].



## DEFENSIVE DRIVING

Tells your drivers that preventing accidents is not so much the knack of squeezing out of tight places as it is the ability to dodge

trouble BEFORE they get into it. Keep your equipment in safe condition, follow at a safe distance, stop slowly, use hand signals, consider others. 20 minutes. [Class I Film].

## IF IT HAPPENS

Three important things to remember if you have an accident: 1. keep the accident from getting worse—set out flares; 2. record all the facts—get all names, addresses, license numbers, etc.; 3. get your vehicle back on the job as soon as possible. 20 minutes. [Class I Film].

## P. U. D. DRIVER WINS AGAIN

The story of a typical day in the life of a pick-up and delivery driver—how he resists the temptation to ignore the safety rules. Points out that the real professionals are the best drivers on the road. They check their trucks every morning, they look both ways before entering traffic and at intersections, they stay within the posted speed limit, make their turns from the proper lanes, follow at safe distances, are courteous to other drivers. 20 minutes. [Class I Film].

## PILOTS OF THE HIGHWAY

Moves from the first interview to the day the new man becomes a full-fledged "pilot of the highway". An excellent indoctrination film that covers all the safety fundamentals; gives the "why" behind your careful training efforts. Covers emergency maintenance, vehicle inspection, I.C.C. speed regulations, road signs, standard hand signals. 20 minutes. [Class I Film].

# THE PROFESSIONAL SAFE DRIVING SERIES

## —5 safety psychology films aimed squarely at experienced drivers

The late Wilbur Shaw, former President of the Indianapolis Speedway Corporation and three-time winner of the 500 mile classic, narrates this popular film series that dramatizes the whys and hows of safe driving. Shaw demonstrates that the right kind of practice, sensible health habits, concentration and correct mental attitude are as necessary to keep a professional driver from having accidents as to keep a professional athlete in winning form. Big name baseball, bowling and golf stars contrast the fine points of their sports with the skill and finesse the "pro" drivers rely on to maintain their safety records.

### SKILL IS YOUR BUSINESS

Wilbur Shaw illustrates that with relaxed coordination, professional driving skill can become automatic—can be maintained day after day regardless of adverse traffic conditions or unexpected emergencies.

### THE CHAMP BECOMES DEAF AND BLIND

Lloyd Mangrum points out that the ability to shut out distractions makes the difference between a championship golfer and a duffer—and that concentration is just as important to pro drivers as it is to pro golfers.

### NINETY-DAY FLASH

Paul Richards, prominent baseball figure, shows how a slight miscalculation repeated often enough can become a disastrous habit, and how a small driving error, repeated frequently will lead inevitably to accidents.

### WATCH YOUR HANDICAP

Ned Day, long-time bowling champion explains that drivers, like professional bowlers, can handicap their performances through lack of sleep, improper food and health habits. The film correlates clean living habits with clean driving records.

### TAKE A LOOK AT THE ODDS

The concluding film in the series shows that the right attitude towards safety is the best insurance against accidents—proves that the odds are always in favor of the driver who plays it safe.

Available in color or black and white. Running time of each film, 10 minutes. 16mm—Black and white [Class V] 16mm—Color [Class VI].





#### PASSENGER SAFETY

A new driver training booklet that shows bus drivers how they can prevent boarding, alighting, and on-board accidents. Covers skills and attitudes that safe-guard the rider from the time he steps off the curb to board the bus until he has safely alighted. 2-color, 24 pages. 3" x 5".

#### HOW TO BE A SMOOTH OPERATOR

A new booklet revealing the secret of smooth operation—the skillful coordination of driver, vehicle and traffic. Points out how it will prevent accidents, spare the driver's nerves and stretch the life of his vehicle...leave him relaxed and pleased with his job at the end of a day. 24 pages, 3" x 5".

#### THE YOU FACTOR IN ACCIDENT CAUSES

Aimed at the basis, underlying personal factors that cause transportation accidents. Its 24 pages strike home with every YOU factor from temper to worry. The cartoons invite reading and the hard hitting text spares no punches in showing drivers how important these factors are in accident causes. 3 1/2" x 5 1/2". Specify choice of Truck or Bus edition.

#### DEFENSIVE DRIVING

Two popular 24-page booklets filled with sound tips on good driving, backed up with cartoon illustrations picturing the folly of aggressive or sloppy driving habits. Designed to convince drivers that preventing accidents is not so much the knack of squeezing out of tight spots as it is the ability to anticipate and avoid such situations in the first place. 3" x 5". Specify choice of Truck or Bus edition.

#### DASH STICKERS

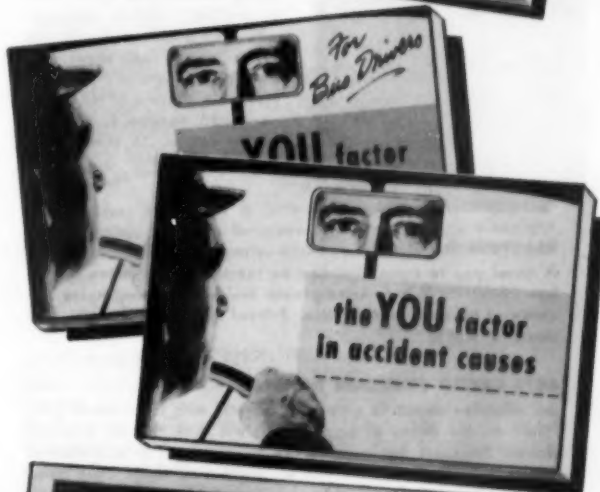
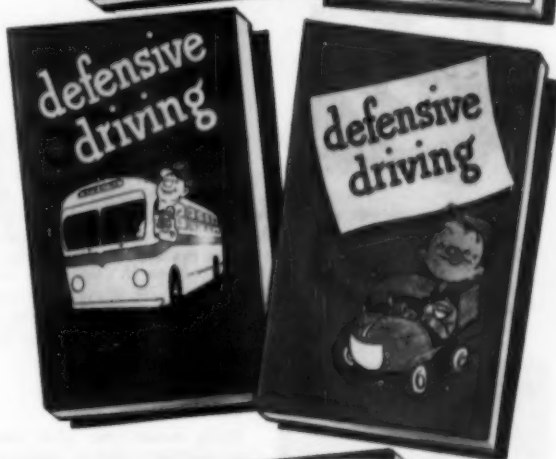
A new type of ever-present safety reminder that adheres to any type of surface! They are bright, 4-color safety ads that keep drivers on their toes. Carefully chosen subject matter makes them equally effective for truck drivers, bus operators and passenger car drivers. 3" x 6". Sold only in sets of 12 different stickers.

#### DASH CARDS

Colorful, illustrated cards to keep drivers safety-awake when they are behind the wheel. The 3" x 6" cards slip into metal holders fastened to the dash. Subscription includes 24 cards printed on both sides—enough for 4 changes per month. Metal holders are free with each set. Specify choice of Truck or Bus sets when ordering.

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices





## WHY BACK INTO TROUBLE?

Safetygraph #101

An illustrated safety talk for commercial truck drivers. It gets down to actual cases and teaches drivers when and why to avoid unnecessary backing, hazards to look for, curb parking hazards, how to back safely, and tells the safe backing speeds.



## YOUR MARGIN FOR SAFETY AT INTERSECTIONS

Safetygraph #102

Contains suggestions for commercial vehicle drivers on how to prevent accidents at intersections. It warns to be suspicious of all intersections, to avoid sudden stops, to obey traffic signals, how to make left turns, and to be on the alert for pedestrians.



## DRIVER MEMO PADS

Every memo you give your drivers is a safety reminder when you use these handy size memo pads. Each sheet features a miniature safety poster. Available in sets of 48 pads; each pad bearing a different poster design. 25 sheets to a pad, size 4" x 4 1/2".

## REACTION TIMER

A novel way to focus attention on reaction time. Shows drivers how important it is to know proper braking distance, makes him aware of his own reaction time. Printed in 2 colors on light card stock. 3" x 11 3/4".

## SAFE DRIVER SHOULDER PATCH

An effective award to give your drivers, with their award pins. Worn on the sleeve of his jacket, it will show that he is a safe driver. An exact duplicate of the award pin, it is embroidered in rich yellow, blue, green and white silk on a beige cloth background. Size is 3 by 4 inches and is available in the same years as the award pins.

## SAFE DRIVER AWARD BANNER

Dress up your award presentation ceremony with this striking banner. The award emblem is shown in three glowing colors on a white satin background, edged with rich 2" gold bullion fringe. 40" x 41". Sold only to members receiving Complete Motor Transportation Service.

## EXPERT DRIVER AWARD CERTIFICATES

A new award certificate for exceptional safe driving performance. Available in blue for 5 year Safe Driver Award Winner, silver for 10 year Award Winner, and gold for 15 year Award Winner. Name of winner will be hand lettered on certificate if requested. Available only to members receiving the Complete Motor Transportation service. 8" x 10", suitable for framing.

## MOTOR TRANSPORTATION

Elements of fleet program, driver selection, selection experience, driver training, training set-up, sustaining interest, records, reports, analysis and preventive maintenance. A reprint of Section 20—Accident Prevention Manual for Industrial Operations. 21 pages, 5 3/4" x 8 3/4".

## FLEET SAFETY MEMOS

2. Fleet Safety Posters, 1950.
3. Publicity Procedure When Presenting Safe Driver Awards, 1950.
10. Protective Coloring for Commercial Vehicles, 1950.
13. Safety Meetings for Commercial Drivers, 1950.
18. Investigating Commercial Vehicle Accidents, 1950.

## PUBLIC SAFETY MEMOS

22. Brakes and Stopping of Motor Vehicles. January, 1953. 15 pages. General information on brakes and methods of measuring stopping ability.
28. Use of Skidmarks in Calculating Motor Vehicle Speeds. April, 1940. 15 pages. Supplements information contained in Memo 22.

## ACCIDENT RECORD FORMS

Record forms, prepared specifically for the Motor Transportation Industry, to enable them to quickly record and analyze complete accident experience. Order by number and title.

- VEH-1 Driver's Accident Report (8 1/2" x 11"—2 sides).
- VEH-2 Accident Report Packet (4 3/4" x 8"—2 sides).
- VEH-3 Driver Record Card (8 1/2" x 11"—2 sides).
- VEH-4 Motor Transportation Accident Analysis (8 1/2" x 11"—1 side).
- VEH-5 Motor Transportation Accident Analysis (Long Form) (11" x 16 1/2"—1 side).
- VEH-6 Award and Accident Record (5" x 6"—2 sides).
- VEH-10 Safe Driver Award Record Card (10 1/4" x 16"—1 side).
- VEH-12 Witness Card (3" x 5"—1 side).



See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices

## FALLS—FALLING OBJECTS



### NO LAUGHING MATTER

Here's a film that covers falls from every angle. The scene is a film studio where a group of safety experts are meeting to discuss a training film on fall prevention. As the plan session progresses, each man describes the fall hazards peculiar to his industry—how to prevent them. Clever flash-back illustrations show how to stop falls in every work situation: trucks and trailers, ladders, scaffolds, elevator shafts, stock piles, stairs. Emphasizes the importance of keeping the work area clean; eliminating oil and grease on floors. 15 minutes. (Class I Film)



### THE FALL GUY

Points out that falls are one of the major causes of lost time accidents in most industries. Discusses the hazards that cause various types of falls and how to avoid them. 25 minutes. Black and white. 35mm sound slidefilm (Class I Film).



### THE FALL GUY

Stresses the hazards that cause falls in industry: poor house-keeping, failure to use hand-rails, unsafe ladder practices, undue haste, hitching rides, lack of attention, makeshifts and faulty equipment. 16 pages —3" x 5 1/2".



### FALLS

Safetygraph #16

Shows that falls are one of the most serious sources of industrial accidents. It covers everything from plunging down un-guarded elevator shafts to stumbling over objects. Shows how to prevent falls and discourages the use of makeshift equipment and horseplay.



### LADDER SAFETY

Safetygraph #6

Teaches the four primary rules of ladder safety: 1. Select the right ladder; 2. Inspect it before use—look for weakness or faulty repairs; 3. Secure it—place at proper angle, use non-slip feet, or lash; 4. Use properly—climb the safe way, secure tools.

### HOW TO PREVENT FALLS

Filled with many safety do's-and-don'ts that prevent falls due to jumping, hitching rides, hurrying on stairs, incorrect use of ladders, running. Cartoon illustrations with serious text. 8 pages, 3 7/8" x 8".



### FALLS

Falls rank second only to automobile accidents as a cause of accidental death. This Photo-script pictures ten safety rules for avoiding falls; eliminating fall hazards. 16 pages, 3 1/2" x 6".



### FALLS AND FALLING OBJECTS

Falls—Safetygraph 16  
The Fall Guy—Film  
No Laughing Matter—Film  
Falls—Photoscript  
How to Prevent Falls—Booklet  
The Fall Guy—Booklet  
How Far is Down?—Talk 26 Book 5  
Acts Causing Falls—SIC 161  
Conditions Causing Falls—SIC 185  
Falls Aren't Funny—Talk 46 Book 3  
Slips and Falls—Talk 15 Book 1  
Watch Your Step—Talk 39 Book 2  
Keep Oil and Water Off Floors—Talk 22 Book 2  
Deadlier Than Mt. Everest—Talk 25 Book 5  
Avoid Falls—Walk—Do Not Run—Use the Handrail—Decal S-13  
Walk, Don't Run—Talk 4 Book 1  
Safety Belts—Talk 40 Book 1  
Climbing Around—Talk 17 Book 4  
Knots and Hitches—Talk 32 C & M  
Ladders—SPP 1  
Ladders—Talk 39 Book 1

(Continued next page)

Ladders—SIC 202  
 Ladders—SIC H106  
 Ladder Accidents—Talk 26 C & M  
 Ladders, Brush Painting from—SIC 393  
 Ladders, Climbing—SIC 51  
 Ladders, Erection and Use of—Talk 27 C & M  
 Ladders, Setting Up—SIC 16  
 Ladders, Using Properly—Talk 18 Book 4  
 Ladder Safety—Safetygraph 6  
 Ladders, Working from—SIC 324  
 Ladder Maintenance—SIC 340  
 Ladders, Extension—SIC 178  
 Ladder, Single Cleat—Detail Sheet 8  
 Ladder, Double Cleat—Detail Sheet 9  
 Ladders, Step—SIC 262  
 Scaffolds—SPP 12  
 Scaffold Accidents—Talk 28 C & M  
 Scaffolds, Erection and Use of—Talk 29 C & M  
 Scaffolds, Safe—Talk 38 Book 2

Square Scaffold, Bricklayers'—Detail Sheet 35  
 Independent Pole Scaffold for Light Duty—Detail Sheet 6  
 Independent Pole Scaffold for Heavy Duty—Detail Sheet 7  
 Light Trades Scaffold Horses—Detail Sheet 1  
 Heavy Trades Scaffold Horses—Detail Sheet 2  
 A Well Designed Horse—SIC 2  
 Scaffold Planks, Scabs and Uprights—Talk 30 C & M  
 Scaffold Planks (Testing)—SIC 15  
 Scaffold Planks (Identifying)—SIC 32  
 Roofing Scaffolds—Detail Sheet 23  
 Single Pole Scaffold (for Light Duty)—Detail Sheet 11  
 Single Pole Scaffold (for Heavy Duty)—Detail Sheet 12  
 Suspended Scaffolds—Talk 31 C & M  
 Swinging Scaffolds—SIC 334  
 Stairway Safety—SIC 146  
 Portable Work Stand—Detail Sheet 75  
 Look Out Below!—Talk 29 Book 5  
 Falling Objects—SIC 163  
 Bomb Bays—SIC 808

## FIRE & EXPLOSION



### CAUSE FOR ALARM

Gives a step-by-step description of what to do in case of fire; how to turn in an alarm—then what to do while you're waiting for the professional fire-fighters. In simple terms, it explains what fire is; how they start. It shows workers how to recognize the difference between Class A, B, and C fires; the types of extinguishers—when and how they should be used. 13 minutes. (Class I Film). Also 16mm motion picture (Class V Film).-F



### STOP THE FIRE THIEF

Shows workers how to prevent fires before they start. Actual fire scenes, illustrating how costly and terrible fire can be, lead into a discussion of what can be done to root out the hazards encountered with: flammable liquids, electricity, hot slag, sparks, friction, etc. 13 minutes. (Class I Film) Also 16mm sound motion. (Class V Film).-F



### FIRE

Shows how a careless flip of a match causes a large plant to burn down—put hundreds of employees out of work. This film is an appeal for caution on the part of every employee. 25 minutes. Black and white. 35mm sound slidefilm (Class I Film).

### FIRE PREVENTION

Classification of fires, types of industrial fires, explosive atmospheres, preventing explosions, miscellaneous fire causes, fire-safe construction. A reprint of Section 17—Accident Prevention Manual for Industrial Operations. 23 pages, 5 3/4" x 8 3/4".



### PREVENTING FIRE Safetygraph #10

Explains how it can be prevented by controlling two of the three fire components—heat and fuel. It discusses the major sources of heat in industrial fires; electricity; smoking, and the types of fuel involved in most industrial fires—greasy rags, flammable liquids, etc.



### USING FIRE EXTINGUISHERS Safetygraph #7

Explains the classes of fires, what type of extinguisher to use for each, and how to use it. It also discusses what to do in case of fire. The safetygraph is most effective when used in a two-part course, part 2 being outdoor demonstrations of extinguishers on actual fires.



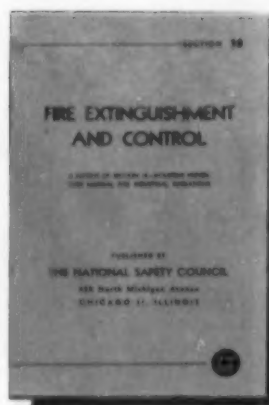


#### DISASTER CONTROL

Handbook reprinted from the American Machinist explains steps that should be taken to avert a disaster, what to do in case of an emergency, and how to get back into production if a disaster occurs. Covers plant protection, bombing, panic, sabotage, floods, rescue, etc. 40 pages, 8 1/4" x 11 1/4".

#### FIRE EXTINGUISHMENT AND CONTROL

Fixed water systems, special fixed systems, portable extinguishers, industrial fire organization. A reprint of Section 18—Accident Prevention Manual for Industrial Operations. 24 pages, 5 3/4" x 8 3/4".



#### FIRE AND EXPLOSION

Fire Prevention—Section 17 APM  
Fire—Film  
Control of Fire—Photocript  
In Case of Fire—Talk 25 Book 3  
What To Do in Case of Fire—Talk 27 Book 2  
Prevent Fire—Talk 24 Book 3  
Preventing Fires—Talk 16 Book 1  
Prevent Fire—Photocript  
Fire Prevention Checklist—SIC 237  
Preventing Fire—Safetygraph 10  
Disaster Control—Booklet  
Be Fire Wise—Booklet  
There'll Be a Hot Time in the Ol' Plant—Booklet  
Stop the Fire Thief—Film  
Cause for Alarm—Film  
How to Report a Fire—Talk 17 Book 1  
Fire in the Plant—SIC 122  
7 Steps to Safety—SIC H108  
Danger—Oxygen—Keep Oil and Grease Away—Decal D-14  
Fire Brigades—SPP 36  
Don't Block Fire Equipment—Talk 28 Book 2  
Danger—Flammable—Keep Flames Away—Decal D-7  
Keep Oily Rags in Metal Containers—Talk 30 Book 2  
Observe "No Smoking" Rules—Talk 29 Book 2  
Danger—No Smoking—Decal D-12  
Smoking Booth—Detail Sheet 88  
Salamanders—Talk 50 Book 1  
Salamanders—Data Sheet D-Const. 4  
Buildings Under Construction—SIC 388  
Gasoline Blow Torches and Plumbers' Furnaces—Data Sheet D-Gen. 6

New Fire Door Bars Flames—Reprint 43  
Caution—Fire Door—Do Not Block—Decal C-2  
Exits, Fire Alarms, and Fire Drills—SPP 19  
Sprinkler Valve—Do Not Close Unless Authorized—Decal F-4  
Fire Hose Holder—Detail Sheet 96  
Fire Hose, Care of Industrial—SIC 471  
Fire-Retardant Treatment for Wood—Data Sheet D-Gen. 20  
Fire-Retardant Treatment for Fabrics—Data Sheet D-220  
Matches—SIC 182

Fire Extinguishment and Control—Section 18 APM  
Fire Extinguishers, Know Location and Use of—Talk 31 Book 2  
Fire Extinguishment—SIC 650  
Fire Extinguishers, Using—Safetygraph 7  
Fire Extinguishing Equipment—SIC 264

Fire Extinguisher Facts—SIC-469  
Dry Powder Fire Extinguisher, How and When to Use a—Talk 22 Book 1  
Carbon Dioxide Fire Extinguisher, How and When to Use a—Talk 21 Book 1  
Fire Extinguishers (Carbon Dioxide Type)—SIC 652  
Foam Fire Extinguisher, How and When to Use a—Talk 20 Book 1  
Fire Extinguishers (Foam Type)—SIC 653  
Soda Acid Fire Extinguisher, How and When to Use a—Talk 18 Book 1  
Fire Extinguishers (Soda Acid Type)—SIC 651  
Fire Extinguishers (Pump Tank)—SIC 655  
Vaporizing Liquid Fire Extinguishers, How and When to Use a—Talk 19 Book 1  
Fire Extinguishers (Vaporizing Liquid Pump Type)—SIC 654  
Fire Extinguisher Washer—Detail Sheet 136

(Continued next page)



#### BE FIRE WISE

Dramatic pictures and copy describe the causes and cures of fire. Hits at poor house-keeping, improper handling of solvents, faulty electricity, man-made fires—shows workers how to be fire-safe. 16 pages, 4" x 7".

#### THERE'LL BE A HOT TIME IN THE OL' PLANT

Convincing booklet showing workers the importance of observing basic fire rules. Humorous cartoons point out that "act first—think last" workers cause fires in plants. Includes tips on what to do in case of fire, and "tell-at-a-glance" fire extinguisher chart. Full color, 16 pages, 4" x 7".



See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices



**CONTROL OF FIRE**

What to do when fires start. It explains the different classes of fires, pictures the various types of extinguishers, how to use them, and on which type of fire. Photostrip, 16 pages, 3 1/2" x 6".

Explosive Ranges of Gases—SIC 290  
Flash Points—SIC 265  
Glass Shield for Test Stands—Detail Sheet 79  
Dust Explosions—SPP 104  
Dust Explosions—SIC 239  
Dust Can Be Dangerous—Talk 34 Book 4  
Fumigating Facts—Reprint Food 1  
Static Electricity—Reprint Gen. 17  
Static Electricity—SPP 52  
Static Electricity—SIC 456

Explosives, Portable Magazine for—Detail Sheet 28  
Fuses and Torpedoes, Storage and Handling of—Data Sheet D-RR 7  
Torpedoes—SIC 688  
Explosives, Handling—SIC 118  
Explosives, Handling—SIC 157  
Fuses (Lighting)—SIC 686  
Fuses (Safe Use)—SIC 687  
Blasting Caps—SIC 433  
Blasting Caps, Keep Radios Away From—Reprint Gen. 32  
Preventing Misfires with Cap and Fuse—SIC 545  
Black Powder, Handling—SIC 364  
Dynamite, Thawing Frozen—SIC 474  
Blasting, Evaluation of Vibration Waves Due to—Reprint 50



**PREVENT FIRE**

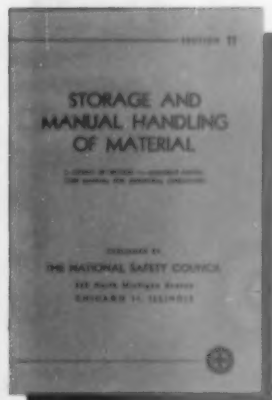
Pictures common fire causes—how they can be spotted and eliminated. Stresses importance of knowing where emergency fire equipment is and how to use it. Photostrip, 16 pages, 3 1/2" x 6".

Frozen Pipes, Thawing Inside Buildings—SIC 131  
Pipe Lines, Bonding Clamps for—Detail Sheet 118  
Boilers—Section 3 APM  
Boilers, Low Water—SIC 339  
Gas and Oil Furnaces (Lighting Burners)—SIC 166  
Oilers—SIC 770  
Pressure Vessels—Section 4 APM  
Refrigerating Equipment—Section 5 APM  
Quick Opening Autoclave Safety Device—Detail Sheet 139  
Steam Valve Control—Detail Sheet 53  
Testing Relief Valves—Detail Sheet 91

For Wood, Paper, Rubbish and Burning Liquids (Class A & B Fires—Not Electrical Equipment)—Decal F-2  
For Burning Liquids (Gasoline, Oil and Paint and Electrical Equipment—Class B & C Fires)—Decal F-3  
For Wood, Paper, Textiles and Rubbish (Class A Fires—Not Electrical Equipment)—Decal F-1

Hot Stuff—SIC 802  
Prevent Home Fires—SIC 349  
Home on Fire—SIC 399  
Dry Cleaning at Home—SIC 276  
Clothing Fire, To Put Out a—SIC 23  
Camp Fires—SIC 348

**HANDLING MATERIALS—MANUAL**



**STORAGE AND MANUAL HANDLING OF MATERIAL**

Covers the proper methods of handling and storing materials of all types; accessories; specific materials: liquids, solids; shipping and receiving, fuel and ashes. A reprint of Section 11—Accident Prevention Manual for Industrial Operations. 30 pages, 8 3/4" x 8 3/4".

**HANDLE WITH CARE**

Presents practical tips on lifting, carrying and piling. Stresses importance of wearing gloves and protective foot gear when lifting. Photostrip, 16 pages, 3 1/2" x 6".





## SAFE HANDLING OF MATERIALS

One-fourth of all industrial accidents involve handling of materials.

Every worker—regardless of industry—lifts, carries, or handles some type of material every day. Whether it's an office or a heavy steel foundry, the same fundamental problem exists; the same simple precautions apply. With simple illustrations this film leads your worker through all the safe material handling "do's" . . . backs them up with pictures of accidents that can happen if you ignore them. 15 minutes. [Class I Film]



## HOW TO LIFT Safetygraph #1

Teaches workers efficient and safe procedures for lifting, handling, and carrying materials. The rules stressed are: keep hands clear; get a good grip; have a good footing; bend your knees; keep the load close to you; get help for heavy or awkward loads.



## HANDLE WITH CARE

Illustrates the use of hand trucks to handle and move materials within the plant and the safe practices and precautions in lifting, carrying and piling, that must be observed, and use of personal protective equipment. 20 minutes. Black and white. 35mm sound slidefilm [Class I Film].



## MY ACHING BACK Safetygraph #10

Treats the subject of back injuries—why and how they happen. The drawings show how the back functions, and what happens when it is strained or twisted. An effective way to drive home the proper ways to lift, and the need for securing help in lifting.

## HANDLING MATERIALS—MANUAL

Storage and Manual Handling of Material—Section 11 APM  
Material Handling Accidents—An Industry Headache—Reprint 52

Handling Materials—Talk 12 C & M

Safe Handling of Materials—Film

Handle With Care—Film

Material Handling—Accident Preventer 101

Handle With Care—Photocopy

Handling Materials—SIC 282

Stockrooms (General Precautions)—SIC 579

Stockrooms (Handling Materials)—SIC 580

Material Storage—Talk 45 Book 1

Storing and Piling—Talk 37 Book 3

Boxes and Crates—SIC 206

Barrels, Boxes and Crates, Unpacking—SIC 438

Really Stacked—Booklet

Tying Materials Together With Wire—SIC 441

Steel Strapping—Flat or Round—Data Sheet D-Gen. 38

Handling Pipe—Tailboard Talk 21

Carrying Long and Heavy Pipe by Hand—SIC 354

Carrying Long Materials on Shoulders—SIC 39

Pipe and Round Bars, Stacking—SIC 114

Pile It Right—Talk 39 Book 5

Piling Materials—SIC 140

Piling Materials—SIC 266

Safe Piling of Materials—Talk 35 Book 2

Bang and Crash—Talk 27 Book 5

Layering and Crosstieing—Talk 13 Book 4

Lumber, Foundation for Stacking—Detail Sheet 111

Lumber, Handling by Hand—SIC 435

How to Lift—Safetygraph 1

My Aching Back—Safetygraph 18

Heave-Ho!—Booklet

How to Lift—Talk 11 C & M

Save Your Back—Talk 36 Book 3

A Little Matter of Anatomy—Talk 9 Book 4

Specialty Lifting—Talk 12 Book 4

How to Lift—Talk 23 Book 1

Why Strain Your Back?—Talk 32 Book 2

Get Some Help—Talk 48 Book 5

How to Lift—SIC 55

Lifting (For Women Workers)—SIC 600

Lifting Sacked Materials—SIC 434



## HEAVE HO!

One of the most complete and effective lifting stories you can give your workers. It takes them through material handling from start to finish, from sizing up the job to actual lifting techniques. Cartoon illustrated, 12 pages, 3" x 5 1/2".

## LIFTING

Accident Preventer 101, shows how to lift materials safely and pinpoints specific lifting precautions: see around load, watch for pinch points, rest load, avoid twisting, etc. Fully illustrated. 2-color. 4 pages, 3" x 5".



See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices



**TWO-WHEEL HAND TRUCKS**  
Safetygraph #25

Shows the correct use and handling of a two-wheel hand truck. It discusses how to load and unload materials, difficult loads, the proper way to lift materials, careful procedure at corners and intersections and the proper use of hand trucks on inclined surfaces.

Storage of Bagged Materials—Talk 46 Book 1  
Piling Bags of Cement—SIC 249  
Handling Drums—Talk 10 Book 4  
Handling Drums—SIC 132  
Handling Drums—SIC 44  
To Skid a Cylindrical Object Safely—SIC 11  
Cylinders—Stacking—SIC 7  
Window Glass, Carrying—SIC 155  
Freight Handling—Photocript  
Freight Handling Safety—Film  
Dock Plates—Talk 51 Book 1  
Dock Plates, Hand Truck Attachment for Handling—Detail Sheet 60  
Dock Plates and Gangplanks—Data Sheet D-Gen. 35  
Runways and Ramps, Portable—SIC 431  
Bulk Cars, Hatch Cover Fastener for—Detail Sheet 84  
Box Car Doors (Opening and Closing)—SIC 444  
Freight Cars and Trucks, Unloading—Talk 36 Book 2  
Tank Cars, Unloading—Talk 42 Book 3  
Railroad Cars, Unloading—SIC 342  
Railroad Freight Cars, Icing—SIC 402



## FREIGHT HANDLING

Covers such standard procedures as how to lift; how to carry; how to pile materials; how to operate hand trucks; unloading hazards, and dock plates. Photocript. 16 pages, 3 1/2" x 6".



## FREIGHT HANDLING SAFETY

Shows the worker how to lift, carry, and pile materials; how to safely operate a hand-truck. The main emphasis is on freight car and motor truck unloading hazards: the safe way to open a freight car door; lowering the dock plate into position and anchoring it; how to guard against "sleepers." The film is in story form and features a luckless cartoon character named Happy Jack whose exploits will hold your workers' interest. 11 minutes. (Class I Film) Also 16mm motion picture. (Class V Film) 1/2

Look Where You're Going—Talk 20 Book 4  
Hand Trucks—Talk 24 Book 1  
Hand Trucks, Operation of—Talk 34 Book 2  
Trucks and Dollies—SIC H113  
Buggy Trucks—SIC 553  
Wheelbarrows, Use of—Talk 51 C & M  
Wheelbarrows—SIC 87  
Two-Wheel Hand Trucks—Safetygraph 25  
Two-Wheeled Hand Trucks, Using A—Talk 38 Book 3  
Two-Wheel Trucks—Talk 15 Book 4  
Hand Trucks—SIC 126  
Four-Wheel Trucks—Talk 16 Book 4  
Hand Trucks—SIC 156  
Barrel Skids, Adjustable Stand for—Detail Sheet 32  
Bin Safety Platform—Detail Sheet 144  
Knuckle Guards—SIC 248  
Coal Bunkers, Working in—SIC 684  
Coal Bunkers, Working in—SIC 685

## HEAVILY STACKED

Gives the basic rules for the safe handling of materials. Clearly shows with simple diagrams and easy-to-understand directions how to pile and store materials. Includes directions on how to store odd shaped pieces, how to cross-tie. 2-color, 16 pages, 3" x 5 1/2".



# HANDLING MATERIALS—POWER

## HANDLING MATERIALS—POWER

Power Handling of Material—Section 12 APM  
Giant Hands of Industry—Film  
Industrial Power Trucks—Safetygraph 13  
Power Truck Driving—Talk 39 Book 3  
Power Trucks, Safe Operation of—Talk 33 Book 2  
Powered Hand Trucks—Data Sheet D-Gen. 51  
Power Trucks (Operation)—SIC 43  
Power Trucks (Care and Maintenance)—SIC 541  
Power Trucks—Talk 31 Book 5  
Sound Warning at Corners and Aisle Crossings—Decal S-6  
No Riders—Decal S-5

Gentry Trucks—Data Sheet D-257  
Gentry (Straddle) Truck Drive Chain Guard—Detail Sheet 132  
Fork Lift Truck, Overhead Guard for—Detail Sheet 90  
Fork Truck Stability, How High Stacking Affects—Reprint Gen. 27

Power Trucks, Fork Lift Operation—SIC 543  
Trucks—Lift, Safety Rack—Detail Sheet 72  
Power Trucks, Electric—SIC 542  
Hydraulic Lift-Type Dolly—Detail Sheet 13  
Skids—Data Sheet D-260  
Skids—SIC 771  
Ramp Safety—Safetygraph 24  
Sidewalk Hatch Cover Brace—Detail Sheet 63

See Page 1 for code to abbreviations  
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## GIANT HANDS OF INDUSTRY

Points out the two main causes of crane accidents are failure to use correct hand signals and failure to keep in the clear. Explains the three basic movements of a crane; the standard hand signals for each. The film goes on to give other safety tips: don't overload—check load-limit charts, how to place sling hooks, balancing long objects, and how to use hand hoists to guide load. These points are driven home by showing accidents that happened when someone "forgot." 15 minutes. (Class I Film)

Gin Poles—Talk 22 C & M  
 Unloading Coal From Berges—SIC 693  
 Unloading Coal From Berges—SIC 692  
 Unloading Railroad Coal Cars—SIC 691  
 Unloading Railroad Coal Cars—SIC 690  
 Overhead Traveling Cranes—SPP 4  
 Crane Operations—Talk 44 Book 3  
 Cranes, Locomotive—SIC 295  
 Overhead Traveling Crane Operation—SIC 466  
 Signals for Locomotive Crane Operators—SIC 524  
 Derricks, Erection and Use of—Talk 23 C & M  
 Hoisting Signals—Talk 19 C & M  
 Standard Whistle Signals—SIC 587  
 Standard Crane Signals—SIC 5  
 Crane and Hoist Operators—SIC 58  
 Suspended Loads—Talk 11 Book 4  
 Hoisting Apparatus—SPP 33  
 Air Hoist Operation—SIC 142  
 Safety Devices at Pinch Points on Power Driven Conveyors—Detail Sheet 77  
 Dust Control for Belt Conveyor Carrying Rock and Similar Products—Detail Sheet 138  
 Conveyors—SPP 35  
 Belt Conveyor Operation—SIC 443  
 Cable Clamps—SIC 36  
 Rope—Talk 43 Book 3  
 Ropes, Hoisting, Apparatus for Measuring Low Spots on—Detail Sheet 125  
 Rope and Block Sizes—SIC 88  
 Rope Knots and Hitches, Some That Can be Depended Upon—SIC 285  
 Rope Knots, Hitches, and Slings, Some That Can be Depended Upon—SIC 210  
 Rope Knots and Hitches, Some That Can be Depended Upon—SIC 200  
 Rope Knots, Hitches and Slings, Some That Can be Depended Upon—SIC 246  
 Rope Hitches and Slings, Some That Can be Depended Upon—SIC 1

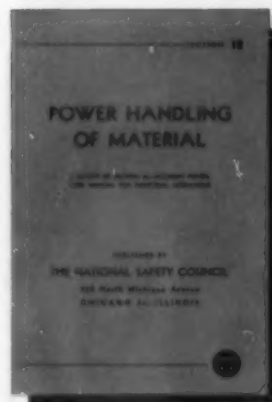


## INDUSTRIAL POWER TRUCKS Safetygraph #13

Discusses parking, loading, inspecting trucks, and safe driving practices. Illustrates the wrong ways to use a truck. Covers operating in close quarters, the safe way to approach and enter an elevator, etc. Drives home the main causes of plant truck accidents.

## POWER HANDLING OF MATERIAL

Shows how power trucks and tractors, conveyors, cranes, other hoisting equipment, ropes, chains and slings should be used in power handling of materials. A reprint of Section 12—Accident Prevention Manual for Industrial Operations. 30 pages, 5 3/4" x 8 3/4".

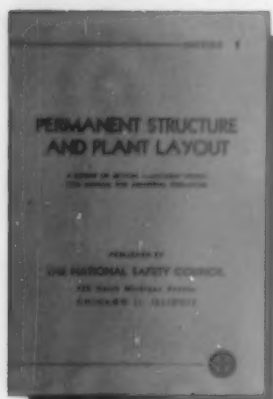


Rope Knots and Hitches, Some That Can be Depended Upon—SIC 222  
 Rope—SIC 14  
 Wire Rope—SPP 26  
 Wire Rope—Talk 25 C & M  
 Wire Rope, When to Discard—SIC 19  
 Wire Rope Slings, Inspecting—Talk 26 Book 1  
 Wire Rope, Lubrication—SIC 98  
 Wire Rope, Safe Loads for Slings—Data Sheet D-Gen. 7  
 Wire Rope—SIC 268  
 Wire Rope, Socketing—SIC 401  
 Wire Ropes, Safe Loads for—SIC 263  
 Wire Rope, Uncoiling and Unreeling—SIC 49  
 Sling, How the Angle Alters Safe Carrying Capacity of—SIC 24  
 Fiber Rope—Talk 24 C & M  
 Fiber Rope—SPP 6  
 Fiber Rope—SIC 203  
 Fiber Rope, Cleaning—SIC 360  
 Fiber Rope, Inspection—SIC 72  
 Fiber Rope, Kinks in—SIC 353  
 Fiber Rope, Maintenance of—SIC 106  
 Fiber Rope, Protecting—SIC 62  
 Fiber Rope, Testing—SIC 231  
 Manila Rope Slings, Safe Use of—Data Sheet D-259  
 Manila Rope Slings, Safe Loads—SIC 47  
 Tackle—Lifting Capacity—SIC 69  
 Tackle, Lifting Capacity of—SIC 61  
 Tackle, Lifting Capacity of—SIC 86  
 Tackle, Lifting Capacity of—SIC 95  
 Rigging—Talk 20 C & M  
 Sisal Rope—Data Sheet D-261  
 Hoisting Chains, Use and Care of—SPP 98  
 Chains—SIC 267  
 Chains, Safe Use of—SIC 151  
 Chain Slings—Safe Loads—SIC 63  
 Sling Chain Hooks—SIC 159  
 Chain Links, Hooks, Castings, To Detect Flaws in—SIC 3



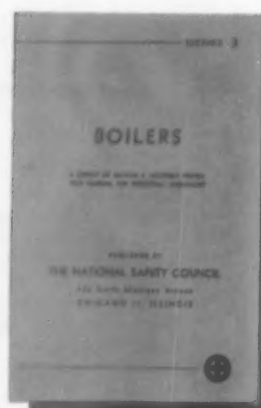
## RAMP SAFETY Safetygraph #24

Covers a wide range of ramp equipment—fork lifts, cargo conveyors, passenger loading stands, tractors and freight carts, air conditioners and fuel trucks. Pertinent points in safe fueling operations, cargo handling and general ramp procedure are brought to light. Suitable for refresher training or indoctrination of new aviation personnel.



## STRUCTURE, PERMANENT AND PLANT LAYOUT

A study of the location, design and layout of a new plant including: site, outside facilities, plant railways, plant layout, building structures. A reprint of Section 1—Accident Prevention Manual for Industrial Operations. 39 pages, 5 3/4" x 8 3/4".



## BOILERS

Purchase and installation, auxiliaries, safety appliances, placing in service, types of fuel, operating in service, taking out of service, emergencies. A reprint of Section 3—Accident Prevention Manual for Industrial Operations. 27 pages, 5 3/4" x 8 3/4".

## PLANT FACILITIES

Maintenance and Maintenance Crews—Section 2 APM

Maintenance and Repair—SIC 259

Maintenance Men—Talk 45 Book 3

Maintenance and Repair Men—SIC 79

Janitors—SIC 134

Boiler Room Tools—Tailboard Talk 16

Boiler Gauge Glasses—SIC 103

Boilers, Working on—SIC 426

Pipefitting, Some Hazards in—SIC 215

Electric Motors—Talk 42 Book 4

Elevators—SPP 15

Electric Elevators—Talk 25 Book 1

Elevators—SIC 271

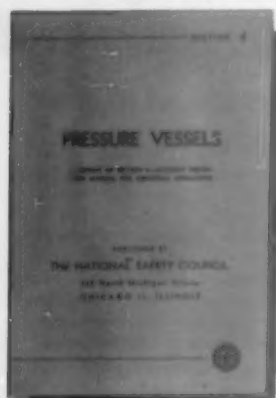
Elevators—SIC 104

Elevator Operation—SIC 41

Man Lifts—Data Sheet D-Gen. 2

Cleaning Machinery and Electric Motors—Data Sheet D-285

Cleaning Exterior Walls of Buildings by Sandblasting or Steamblasting—Data Sheet D-Gen. 12



## PRESSURE VESSELS

The location and design, inspection, training operators, safety devices, operating practices. A reprint of Section 4—Accident Prevention Manual for Industrial Operations. 22 pages, 5 3/4" x 8 3/4".

## MAINTENANCE AND MAINTENANCE CREWS

Including: buildings, excavation and construction, ladders, scaffolds, types of scaffolds, maintenance crews. A reprint of Section 2—Accident Prevention Manual for Industrial Operations. 34 pages, 5 3/4" x 8 3/4".



Floors and Flooring—SPP 11  
Floors, Slippery—Data Sheet D-286  
Floors, Cleansing with Soap and Water—SIC 472

Thirsty Granules—Reprint 47

Window Cleaning—SIC 110

Window Cleaning—SIC 92

Ice and Snow, Removal of in Industry—Data Sheet D-Gen. 43

Ice and Snow—SIC 107

Icicles—SIC 121

Reflecting and Luminescent Materials—Data Sheet D-245

"Hold Cards"—SIC 493

Finish the Job—SIC 446

Materials, Weights of—SIC 138

Piping Systems—SIC 20

Frozen Pipes, Thawing Inside Buildings—SIC 131

Boilers—Section 3 APM

Gas and Oil Furnaces (Lighting Burners)—SIC 166

Boilers, Low Water—SIC 339

Pressure Vessels—Section 4 APM

Refrigerating Equipment—Section 5 APM

Quick Opening Autoclave Safety Device—Detail Sheet 139

Steam Valve Control—Detail Sheet 53

Testing Relief Valves—Detail Sheet 91

## PLANT LAYOUT AND PROTECTION

Permanent Structure and Plant Layout—Section 1 APM

Checking Plans and Specifications for Safety—SPP 53

Color in Industry—Data Sheet D-219

Try Color—Reprint Gen. 10

Stairways, Ramps and Fixed Ladders—SIC 37

Stairway Tread and Riser Dimensions—SIC 478

Wind Force—SIC 270

Pedestrian Guard Rail—Detail Sheet 65

Plant Parking and Public Loading Points—Data Sheet D-Gen. 28

Plant Yards, Safety in—SIC 318

Parking Lot, The—Talk 50 Book 4

Plant Railroad Crossing Gate—Detail Sheet 99

Watchman Safety—Data Sheet Gen. 32

Watchman—SIC 35

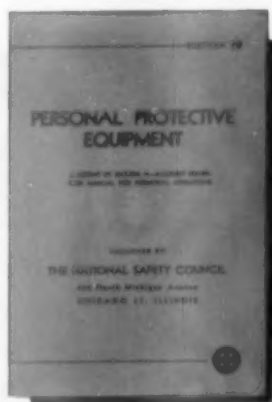
Firearms for Plant Protection—Data Sheet D-Gen. 27

## REFRIGERATING EQUIPMENT

Types of systems, uses, codes, hazards, location of equipment, testing — overpressure devices, fire prevention, toxic and irritating refrigerants, operation and maintenance, treatments for exposure to gases. A reprint of Section 5—Accident Prevention Manual for Industrial Operations. 20 pages, 5 3/4" x 8 3/4".

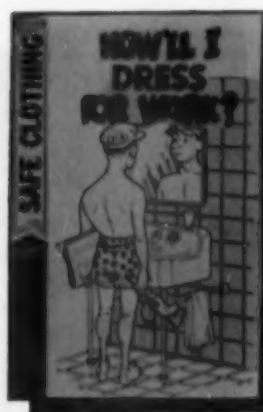


See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices



## PROTECTIVE EQUIPMENT, PERSONAL

Head protection, face and eye protection, respiratory equipment, care of respiratory equipment, safety belts, hand, foot and leg protection. A reprint of Section 19—Accident Prevention Manual for Industrial Operations. 30 pages, 5¼" x 8¾".



## SAFE CLOTHING

Accident Presenter 301, uses "right and wrong way" illustrations and straightforward captions to show workers the proper way to dress for work—the possible danger resulting from wearing improper clothing around machinery, on stairways or ladders. 2-color. 4 pages, 3" x 5".



## EASY ON THE EYES

If you're having trouble enforcing your goggle rules, here's a two-fisted film that will open their eyes. It leads with a dramatic, emotional appeal that shows what it means to be blind or lose the sight of an eye. After this impact, your workers will be an attentive audience to the job-by-job explanation of the type of eye protection required; the three easy rules for eye safety. 20 minutes. (Class I Film) Also 16mm sound motion. (Class V Film)



## MY EYE DEAL

Color cartoon film that combines giggles with goggles. Tells the humorous story of Herkimer and how he learned—by a near miss—the value of wearing safety goggles. Here's 10 minutes of good entertainment with a moral that your workers won't soon forget. (Class III Film)

## CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment—Section 19 APM  
 Personal Protective Equipment—Accident Preventer 301  
 Personal Protective Equipment—Talk 6 C & M  
 Personal Protective Equipment—Illustrated Talk 3  
 Through History With Accident Prevention—Talk 33 Book 5  
 Personal Protective Equipment, Conservation of—SPP 106  
 Dress for Safety—Photocrypt  
 Job Clothing—Talk 6 Book 3  
 Dress for Safety—Talk 17 Book 2  
 Right Clothes, The—Talk 21 Book 4  
 Get in Style—Talk 32 Book 5  
 Clothing for Men—SIC 83  
 Job Clothing for Women—Talk 7 Book 3  
 Clothes Make the Lady—SIC 809  
 Clothing for Women Workers—SIC 601  
 Head Protection for Women Workers—SIC 605  
 Dressing for Winter—Tailboard Talk 10  
 Cold Weather Clothing—SIC 269  
 Safe Clothing for Handling Chemicals—Talk 45 Book 2  
 Corrosive Liquids—Danger, Use Personal Protective Equipment  
 Decal D-8

Chemicals, Protection Against—SIC 42  
 Protective Aprons—SIC 228

Fitting Foundry Leggings—SIC 666

Foundry Safe Clothing—SIC 309

Machinists' Clothing—SIC 230

Clothing for Millwrights—SIC 253

Jewelry on the Job—Talk 8 Book 1

Safety Belts—SIC 386

Work Gloves—Talk 11 Book 1

Gloves—Talk 9 Book 3

Danger—Do Not Wear Gloves While Operating This Machine—  
 Decal D-1

Rubber Gloves—SIC 214

Air Test for Rubber Glove—SIC 4

Rubber Safety Equipment—SIC 534

Why Wear Hard Hats?—Talk 10 Book 1

Hard Hats—SIC 533

Toe Protection—Safetygraph 11

Happy Feet—SIC 602

Safety Shoes Save Toes—Talk 18 Book 2

Foot Guards—Talk 13 Book 1

Foot Protection—Talk 10 Book 3



## WEARING GOGGLES Safetygraph #4

Is a head-long attack on complaint about wearing safety goggles. It shoots holes in time-worn excuses like: "they're too heavy" . . . "this job'll only take a minute." With humor and logic, it wins over non-believers and reconverts backsliders who have been careless about wearing goggles.



## TOE PROTECTION Safetygraph #11

Is a persuasive presentation of the facts about safety shoes. It examines all the common objections to wearing safety shoes, and proves that each is based on unfounded prejudice or lack of information. It also shows some off-the-job uses for safety shoes.

**DRESS FOR SAFETY**

Stresses clothing that fits you and your job, and the need for special protection on special jobs. Covers goggles, hard hats, safety shoes, gloves, etc. Photostrip. 16 pages, 3 1/2" x 6".

**PROTECT YOUR EYES**

Illustrates the two good reasons for wearing safety glasses—both your eyes. Gives the prescription for eye safety; wear the right glasses, make sure they fit, and keep them clean. Photostrip. 16 pages, 3 1/2" x 6".



Safety Shoes—SIC 530  
Protection for You—Talk 34 Book 5  
Eye Protection—Talk 8 Book 3  
Protect Your Eyes—Photostrip  
Easy On the Eyes—Film  
My Eye Deal—Film  
How Industry Protects the Worker's Eyes—Reprint Gen. 2  
Eye Protection—SIC 113  
Goggles—SPP 14  
Goggles and Eye Injuries—Talk 9 Book 1  
Goggles and Eye Injuries—Talk 7 C & M  
Why Wear Goggles?—Talk 19 Book 2  
Wearing Goggles—Safetygraph 4  
Danger—Wear Goggles In This Area—Decal D-13  
Danger—Wear Goggles While Operating This Machine—Decal D-6  
Goggles (Use and Care)—SIC 531

Goggles (Fitting and Adjusting)—SIC 162  
Goggle Fogging—SIC 245  
Wear Goggles—SIC 463  
Keep Goggles and Face Shield Clean—Talk 20 Book 2  
Goggles and Respiratory Equipment—Cleaning and Sterilizing—Data Sheet Gen. 16  
Gas Mask, How to Put on a—Talk 31 Book 4  
Gas Masks, Test For Fit—SIC 97  
Gas Masks—SIC 212  
Gas Masks—SIC 305  
Hose Masks—SIC 425  
Respirators, Use and Care of—Talk 12 Book 1  
Respirators—SIC 532  
Welding Helmets and Hand Shields—SIC 538  
Plastic Face Shields—SIC 535  
Tinted Optical Media—Reprint Gen. 31  
Impact for Heat Treated Lens—Detail Sheet 98

## HOUSEKEEPING

**GRIME DOESN'T PAY**

The importance of good housekeeping in preventing plant accidents. Story depicts a man hunt for the criminal "Poor Housekeeping," who is finally tracked down and thrown out by "Good Housekeeping," convincing workers that "grime doesn't pay." 15 minutes. Black and white. 35mm sound slidefilm (Class I Film).

**KEEP IT CLEAN**

Sells the idea that it's easy to keep the plant ship-shape if everyone cooperates—does his small part of the job. Presents an easy-to-follow housekeeping checklist keyed to a series of before and after shots of typical plant scenes. Emphasizes that a clean plant makes the job easier, safer, a lot more pleasant. 15 minutes. (Class I Film)

**PLANT HOUSEKEEPING**  
Safetygraph #5

Stresses it's up to workers to wipe up grease, put scrap in a box, keep the work place clear, and lockers clean. It discusses the safe way to stack materials; start foundations; keep piles straight; cross-tie layers; stepback of tall piles; keep aisles and fire exits clear.

**HOUSEKEEPING**

Plant Housekeeping—Safetygraph 5  
Keep It Clean—Film  
Grime Doesn't Pay—Film  
A Clean Plant—Photostrip  
K. O. Dirt and Disorder—Booklet  
Ship Shape—Booklet  
New Look for Spring, The—Talk 18 Book 5  
How Much Housekeeping—Talk 11 Book 3

See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices





## A CLEAN PLANT

A clean plant is safer, more efficient, a better place to work. This photoscript points out that plant housekeeping is the responsibility of each worker. Photoscript. 16 pages, 3 1/2" x 6"

A Clean Department Is a Safe One—Talk 14 Book 1  
Work Place Housekeeping—Talk 23 Book 4  
Housekeeping on the Job—Talk 9 C & M  
Keep Equipment in Right Place—Talk 25 Book 2  
Keep Materials and Equipment Out of Aisles—Talk 40 Book 2  
Keep This Space Clear—Decal S-10  
Plant Housekeeping—SIC 29  
Fire Safety and Prevention—Accident Preventer 201  
Keep Lockers and Washrooms Safe—Talk 24 Book 2  
Lockers and Washrooms—Talk 12 Book 3  
Broken Bottles and Glass—Data Sheet D-F 2

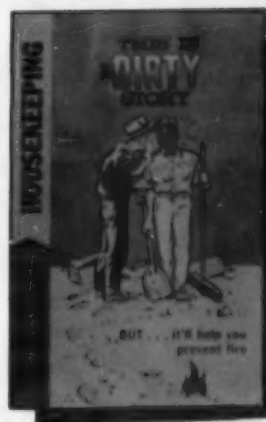


## K. O. DIRT AND DISORDER

Sells workers on plant housekeeping. Colorful cartoons and light-touch writing drive home important points in keeping the plant clean, neat and orderly . . . free from accident and fire hazards. 16 pages—3" x 5 1/2"

## HOUSEKEEPING

Accident Preventer 201, illustrates that good housekeeping isn't just for looks—it prevents fires. Warns against piling materials near heat, leaving rags, rubbish or sawdust shavings on floor, and blocking fire extinguishers and sprinklers. 2-color. 4 pages, 3" x 5"



Glass Disposal Cans—Detail Sheet 52  
Broken Glass Disposal Unit—Milk and Bottling Plants—Detail Sheet 51  
Broken Glass—SIC 681  
Pick Up Loose Objects—Talk 23 Book 2  
Keep Tools in Safe Condition and in Proper Place After Use—Decal S-6  
Nails—Pull Out, Bend Down, Pick Up—Talk 26 Book 2  
Deposit Waste Material Here—Decal S-11  
Spills and Splashes—Oil and Water—Talk 13 Book 3  
Keep Floor Clean Around This Machine—Decal S-7

## SHIP SHAPE

A nautical-theme booklet that shows the importance of good housekeeping. Amusing cartoons impress the need for cleanliness, proper storage of tools and materials and fire prevention to reduce accidents. 16 pages, 3" x 5 1/2"



# INDOCTRINATION



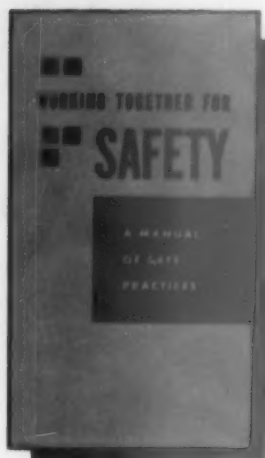
## ACCIDENTS DON'T HAPPEN Safetygraph #8

Gets right down to the grass root of safety—to the basic principle that accidents don't happen, they are caused. It discusses unsafe conditions and unsafe acts, cites specific instance of each type, and shows how each accident could have been prevented.

## INDOCTRINATION

Accidents Don't Happen—Safetygraph 8  
Accidents Don't Just Happen—Talk 2 Book 4  
Why Accidents Should Be Reported—Tailboard Talk 1  
Safety Pays Off—Talk 1 Book 2  
Nobody Is Trying to Blame Anybody—Talk 3 Book 4  
Why Do We Have Safety Rules?—Talk 43 Book 5  
Why We Have a Safety Program—Talk 1 Book 1  
The "Why" of the Safety Program—Talk 4 Book 3  
The New Worker—Talk 2 Book 1  
Helping the New Worker—Talk 3 Book 1  
The New Worker—SIC 539  
Tips to the New Worker—SIC 302  
Help the New Employee—SIC 101

## GENERAL RULES & PRECAUTIONS



### WORKING TOGETHER FOR SAFETY

Handy manual of safe practices for workers. Covers general safety regulations, special operations, fire prevention, lifting and carrying, piling, health and many other topics. Ideal for orienting new employees, and as a safety refresher for older employees. 2-color illustrations, 32 pages, 4" x 7".



### LEARN AND LIVE

No matter how specialized your operations, your company rule book probably includes the 10 fundamental safety rules discussed and illustrated in LEARN AND LIVE. Too often when workers read these rules they get little out of them; they are unable to visualize from a few words on a printed page what can happen if the rules are ignored. This film lifts these rules from your book and brings them to life with action shots showing how and why they are applied. 15 minutes. (Class I Film)

### STEPS TO SAFETY

A personal checklist of sound safety rules that apply to any worker on any job—and off-the-job, as well. The straight-from-the-shoulder approach portrays the safety program as the personal concern of each employee. Cartoons on all its 16 pages. 3" x 5 1/2".



### LEARN SAFETY

Presents the ten basic rules for the prevention of personal injury. Discusses unnecessary chances, horseplay, handling material safely, first aid, safe clothing, good housekeeping, etc. Photocopy. 16 pages, 3 1/2" x 6".



### SHOP SAFETY

An illustrated safety manual for workers. Deals with protective clothing, hand and power tools, materials handling, machinery, plus many other safety measures. 32 pages, 5 1/4" x 8 1/4".

### SO HELP ME!

A springy safety rule booklet jam-packed with no-accident tips, eye catching safety cartoons and lifting safety jingles. An inspirational memory refresher highlighting the tried and true safety precautions. 20 pages—3" x 5 1/4".



Learn and Live—Film  
Working Together for Safety—Booklet  
Steps to Safety—Booklet  
Shop Safety—Booklet  
So Help Me!—Booklet  
Learn Safety—Photocopy  
Industrial Safety Rules—Their Formulation and Use—SPP 80  
10 Commandments of Safety—SIC 366  
My Safety Program—SIC 460  
Hazard Spot Card—SIC 775  
Take Time Enough to Do the Job Safely—SIC H117  
Help To Keep Your Workplace Safe—SIC 461  
Bench Workers—SIC 400  
Protect Your Hands—Talk 21 Book 2  
The Injured Worker Returns—SIC 310  
Scrap Metal Salvage Men—SIC 578  
Industrial Accident Prevention Signs—SPP 81  
Signs Make Sense—Talk 47 Book 3  
Safety Rules and Signs—Talk 9 Book 2  
Warning Signs—SIC 112  
Warning Signs—SIC 119  
Warning Signs—SIC 160

### POSTERS

The majority of the posters produced by the Council serve primarily for molding attitudes and behavior. You will also find a large selection covering General Rules and Precautions. For posters that fall in this category, see the 1955 Directory of Occupational Safety Posters.

See Page 1 for code to abbreviations  
See pages 66 to 69 for Index and Prices

# Posters

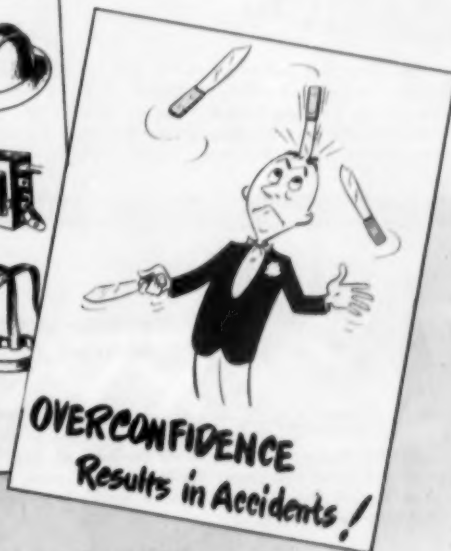
the mass advertising and selling aids for safety

## POSTERS SELL YOUR SAFETY PROGRAM BECAUSE

- ★ they are aimed straight at the sources of trouble—the underlying worker attitudes and the acts that lead to accidents
- ★ they bring interest, color and impact into your program
- ★ they cash in on the three basic rules for good advertising — Timeliness, Repetition and Continuity
- ★ they reach your entire audience many times each day at a low, low cost—driving safety messages home at the time and place they can do the most good



Those who do not wish to select their own posters may have them selected by Council staff engineers, and shipped automatically each month. Staff engineers make selections each month to provide specialized automatic poster service for 56 different types of operations. See the DIRECTORY OF OCCUPATIONAL SAFETY POSTERS for a complete explanation of automatic poster service, or write the Council for information.



The Council's DIRECTORY OF OCCUPATIONAL SAFETY POSTERS illustrates 744 poster in miniature, covering safety, fire prevention and health, classified and indexed for easy reference.

Posters are produced in four sizes: "A" size, 8 1/2" x 11 1/2"; "B" size, 17" x 23"; "C" size, 25" x 38"; and the 8-sheet Jumbo described on the facing page. One "C" poster and one Jumbo poster are produced each month, and are shown in the NATIONAL SAFETY NEWS along with other new posters produced during the year. All posters shown in the Directory and the NEWS are available throughout the year.

# "PERSONAL SIDE OF SAFETY"

**corrects unsafe attitudes by helping your workers  
to ANALYZE and UNDERSTAND themselves**

With a front-door approach and stair step logic, **PERSONAL SIDE OF SAFETY** reduces this complex attitude business to easily understood fundamentals. The five films build a convincing formula for personal safety that shows a worker that no one can keep from getting hurt if he doesn't help. He must know his job and know himself; be the master of his habits and emotions; believe in the power of safety; **WORK AT IT!** The message is believable because each worker sees himself in the humorous cartoon sequences and actual work scenes. It's painless training at its best.



**SAFETY RECORD**

Emphasizes that award winning safety records don't "just happen." They are the results of careful planning and hard work. They are the accomplishment of the individual worker who adopts a "be safe" attitude for himself and towards his fellow workers. 15 minutes. (Class II Film).



**2 STEPS TO SAFETY**

This film shows that you've got to mix determination with knowledge and experience. **KNOW YOUR JOB**—be thoroughly aware of the possible hazards; how to avoid them. **KNOW YOURSELF**—the personal peculiarities that make for accidents; how to control them. 15 minutes. (Class II Film).



**LET HABIT HELP**

Explains the steps in developing a new habit pattern; how to erase an unsafe habit. Each routine task is accomplished largely by one or more of the habit sequences we form. It's as easy to build safety into your habits as it is to do things unsafely. 15 minutes. (Class II Film).



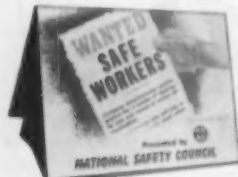
**GET A GRIP ON YOURSELF**

Enlarges on the idea of self understanding. Shows how feelings and emotions can undermine determination. Explains how to recognize the danger signals in time—make your emotions work for instead of against you. 15 minutes. (Class II Film).



**DECIDE TO BE SAFE**

Wraps up the formula for personal safety with a quick review of the key points made in the previous films. To make it all work, it explains, each of us has to underline our efforts with determination—a sincere decision to be safe. 15 minutes. (Class II Film).



**WANTED—SAFE WORKERS**  
Safetygraph #15

An informal session on what makes a safe worker. Deals with the worker who understands his job and does it well, and with the fellow who learns the hard way. Covers, in story style, how to act at work, and dress at work. Stresses cooperation between fellow workers.



**DOES YOUR ACCIDENT SHOW?**  
Safetygraph #17

Attacks the employee's attitudes which lead to accidents. It shows employees the reasons why people pull boners that can lead to injury: being "safety lazy," failure to follow rules, horseplay, distractions, failure to think, not feeling up to par.

See Page I for code to abbreviations — See pages 66 to 69 for Index and Prices

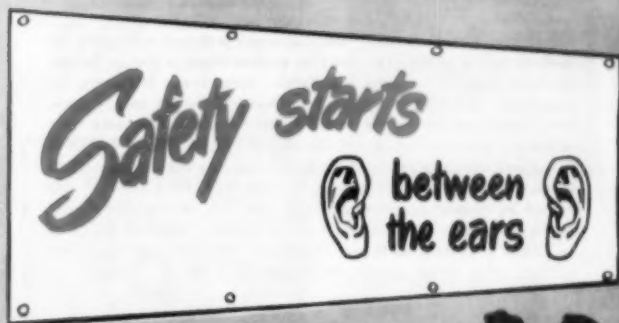


# the <sup>TWO</sup> BIGGEST <sup>5</sup> things in safety!

## SAFETY BANNERS

A brand-new KING-SIZE promotion—10 feet long—3½ feet high—printed on heavy cloth in four or more sparkling colors!

Indoor style has eight metal grommets for easy hanging. Outdoor style, on extra-heavy cloth, has air vent flaps and ropes firmly stitched into the top and bottom of the banner.



Both styles (same design) available on subscription—one design per month—starting April 1, 1955.

## JUMBO POSTERS

- ★ so **BIG** they can't be missed
- ★ so **COLORFUL** they demand attention
- ★ so **FORCEFUL** they can't be ignored

From the president right down to the office boy, nobody can help but give a thought to safety when passing your Jumbo Poster board. Spotted near the entrance, these giant billboards also carry plenty of community relations value. They literally shout to every passer-by that your company is concerned with the safety and welfare of its workers.

11 feet 8 inches wide by 9 feet 11 inches high, they come in eight sheets for easy handling. The ink and paper used are of regular outdoor quality, and are weather resistant for at least 30 days.

A subscription gives you 12 posters—a new message each month. Plans for erecting an attractive Jumbo Poster display board will be sent on request. See page 66 for prices.





**IF YOU TOOK YOUR  
FAMILY TO WORK  
WITH YOU**

Proves that a worker's family plays an important part in his attitude towards safety on the job. The film evolves about a day in the life of Jerry Reynolds and his son Butch. Jerry keeps imagining he sees Butch watching him do things that violate the safety rules. He is reminded of how he scolds Butch for doing the same type of unsafe things at home. As the day progresses, Jerry becomes more and more safety conscious. He realizes that even though Butch was not present physically, the boy was on his mind all day—that he should practice safety on the job just as though his family were with him—waiting for him to break some of the rules he's been preaching to them. 13 minutes. Black and white. (Class I Film). Also 16mm sound-motion picture (Class V Film). ❖



**TAKE TIME TO LIVE**

Shows the worker how, by allowing himself just a few minutes more each day he can be relaxed and happy at the end of the day, instead of being worn to a nub. The central character in the film is Horace, the worker who is always in a hurry. He gets up late, doesn't have time for breakfast, trips on his way out, runs for the bus—and with all the rushing is late to work. By contrast, the scene changes to show Horace getting up on time, enjoying his breakfast, leaving for work in a normal fashion—and arriving on time. The film proves that nine out of ten accidents in the home or on the street are caused by rushing. Figures from an actual test prove that allowing only 5 minutes more a day will prevent hurrying and give a worker time to get to and from work with ease and safety. 12 minutes. Black and White. (Class I Film). Also 16mm sound-motion picture (Class V Film). ❖



**AN ACCIDENT HAPPENS  
TO SAM**

In most plants the industrial nurse is the safety man's star salesman. Your workers will learn and laugh as the accident-wise Miss Miller proves to skeptical Sam that accidents DON'T just happen. She shows him that accidents aren't funny—that they can be stopped by using a little common sense. She first softens him up by showing him some "scare" pictures of major accident injuries; then follows up by explaining why they happened. By the end of the day, Sam's converted. 13 minutes. (Class I Film). Also 16mm motion-picture (Class V Film).



**SAFE AS YOU MAKE IT**

Combines sound safety training with amusement park thrills by contrasting the safety of the high rides with the hazards of the safe-appearing things we encounter every day. Each individual must observe the simple safety rules, weed out the hazards and not take foolish chances. This fast moving film captures interest—tells safety with the speed of the "Flying Turns". 10 minutes. Black and white, 16mm sound motion. (Class V Film). ❖

**SAFE WORKER**

This pocket-size safety salesman works wonders with those who've been told—but haven't been sold. It feeds your workers a regular diet of sound safety psychology with cartoons, humor and homey philosophy and shows how it profits to do every job the safe way. Published monthly, it can be imprinted with your company name. 16 pages, 3 3/8" x 5 7/8".



**WHAT'S IN IT FOR ME?**

A brand new booklet that points out to the worker the personal advantages of practicing safety. Proves that it's not where he works, but how he works that makes for good safety records. Humorous illustrations, serious text. Full color, 16 pages, 4" x 9".

**SAFETY ZOO**

Pokes fun at human foibles with an amazing collection of animal photos combined with clever captions. Safety committeemen and foremen will especially enjoy it. 32 pages, 5 1/2" x 8".



### DEADLY IDEAS

A new comic-type booklet in full color. It routs out seven foolish attitudes that hamper accident prevention . . . blasts them with a double-barreled charge of logic and lampoon. 16 pages, 4" x 9".



### AREN'T PEOPLE FUNNY?

Illustrates a number of common human foibles and faults that can lead to accidents. It shows in humorous fashion the relationships between attitudes and unsafe behavior, spotlighting various unsafe characters. 16 pages—3" x 5½".



### A WISE BIRD FOLLOWS THE RULES



### A WISE BIRD FOLLOWS THE RULES

Answers a basic need in safety programs — showing workers why rules exist, who makes them, and how they are formulated. Clever cartoons and copy give workers a better slant on the safety program. 16 pages—3" x 5½".

### I JUST GAVE MY SEAT TO A LADY!



### I JUST GAVE MY SEAT TO A LADY

A collection of safety cartoons by Walt Ditzen. 120 pages of humorous and enjoyable safety training. Fine souvenir for safety dinners or plant rallies that workers will enjoy for months. 4½" x 6½".

Jumbo Poster Billboard—Detail Sheet 115  
Jumbo Poster Billboard—Detail Sheet 114  
Safety Posters and Bulletin Boards—SPP 38

Working Together—Talk 34 Book 3  
Citizenship in the Plant—Talk 6 Book 1  
Stand Up and Be Counted—Talk 1 Book 3  
Team Work Prevents Accidents—Talk 6 Book 2  
Know Your Job—Talk 2 Book 3  
Finish the Job—Talk 35 Book 3  
Five Minute Safety Talks for Foremen—Book 5  
Safety Record—Film  
Let's Beat Our Old Accident Record—Talk 2 Book 2  
Accidents Are Caused—Talk 5 Book 2  
Think First—Avoid Accidents—Talk 7 Book 2  
Near Accidents Are Warnings—Talk 3 Book 2  
Luck and Unnecessary Chances—Talk 10 Book 2

Hurry-Up Can Hurt—Talk 19 Book 4  
Tight Squeezes—Talk 6 Book 4  
Get Help If You Need It—Talk 7 Book 4  
Close Calls—Talk 49 Book 3  
Over-Estimating the Other Fellow—Tailboard Talk 4  
Don't Be Safety Lazy—Tailboard Talk 3  
Safety Is Personal—Talk 5 Book 3  
Good Habits Help—Talk 3 Book 3  
Habits and Safety—Talk 5 Book 4  
Set A Good Example—Talk 4 Book 4  
Personal Safety Check List—SIC 101  
Hours of Danger—SIC 256  
Inattention—SIC 177  
Horseplay—Talk 5 Book 1  
Horseplay—Tailboard Talk 6  
Horseplay Doesn't Pay—Talk 8 Book 2  
Juvenile Joe—The Horseplayer—SIC 154  
This One Will Kill You!—Talk 30 Book 5

### "C" SIZE POSTERS

This 28" x 38" poster does the same job inside the plant as the Jumbo poster does outside—it advertises your safety program. It tells everyone, every day that safety is a top priority matter in your company. Twelve new "C" size posters are released each year—one per month. Each is previewed in the NATIONAL SAFETY NEWS. May be ordered on annual subscription or individually.

### POSTER FRAMES

Black enameled metal frames, made to fit "A" and "B" size Council posters. Frames are large enough to accommodate cardboard backing and a glass or plastic sheet in front of the poster.

### POSTER ELECTROS

You may obtain electrotypes of any poster illustrated in one color in the poster directory or in the NATIONAL SAFETY NEWS. Order by poster number. 1½" x 2¾".

### PAYROLL ENCLOSURES

Miniature black and white reproductions of safety posters. Select 12 different posters from those shown in one color in the poster directory or in NATIONAL SAFETY NEWS. Enclosures are printed 12 to a sheet; then cut to 1¾" x 2½" size. Minimum order—1200 enclosures (100 sheets). Quantities of each of the miniatures selected must be identical. When more than one group of 12 are ordered, each group of 12 is priced as an individual order. See Directory of Occupational Safety Posters for details.

# 3 Distinguished Awards

## Enameled NO-ACCIDENT AWARD PINS\*



An outstanding new design bearing the National Safety Council name. The red, green and white jewelers glazing enamels are fused, flint-hard, at high temperatures, then stoned and polished to sparkle like a gem. All lettering and outlining finished in Rose Gold. Pins showing individual years, from 1 to 40, are stocked with nickel-silver joint, pin and safety catch. This award available on award incentive items.

## Personalized NO-ACCIDENT AWARD PINS\*



This new style permits you to have your own set of award pins at a fraction of the usual cost. Your company name will appear in gold letters against a green glazed enamel background. The gold shield bears black debossed numerals of your choice, from 1 to 40. These pins are of the same basic design and quality as the pins described above. If you wish, however, you may substitute either a clutch-pin or screw-post fastening (at reduced prices) for the pin and safety catch. \$25.00 die service charge

on your original order. Personalized awards also may be ordered affixed to award incentive items.

## Metal NO-ACCIDENT AWARD BUTTONS\*



These are the Council's economy awards—widely used throughout industry for over 20 years. The legend is embossed in jewelers bronze and the Green Cross is color filled. All years are stocked, from 1 to 40, with screw-post fastenings only.

BRONZE—1, 2, 3, and 4-year awards.

SILVER PLATE—5, 6, 7, 8, and 9-year awards.

GOLD PLATE—all years from 10 to 40.

### \* NOTE:

Award pins and buttons bearing the National Safety Council name are sold only to Council members and government agencies. In ordering, please submit brief description of the plan for use, including the basis for determining who will receive awards. These awards may not be used as driver awards. Write for information on the National Safety Council Safe Driver Award.

## FASTENINGS



pin & safety catch



clutch-pin



screw post

## SAFETY LAPEL PIN



The Green Cross for Safety emblem. It is 3/8" diameter, in polished gold finish with sparkling green and white enamels. Clutch back pin.



## SAFETY CONTEST TROPHY

An attractive award plaque to reward the best safety record in inter-department or inter-organization contests. Solid bronze casting. 6" x 7 1/2" on an 8" x 10 1/2" walnut plaque. Space for engraving inscription. [Sold only to Council Members and U. S. Government Installations.]



## MERITORIOUS SERVICE AWARD

A striking new award with gold lettering and laurel wreath, accented with red, green and white jeweler's enamels. Legend "Safety Suggestion Award" carried in stock. Nickel-silver joint, pin and safety catch. Pins with your company name in outer band or another legend in center can be made. Write for details.

## MAINTAINING INTEREST

Maintaining Interest in Safety—SPP 74

Safety Contests—SPP 74

Suggestion Systems—SPP 40

Give Us Your Ideas—Talk 1 Book 4

Suggestions Welcome—Talk 48 Book 3

Making Safety Suggestions—SIC 109

Award Plan for Recognizing Good Industrial Safety Records—Booklet

## GREEN CROSS ELECTROS

An electrotype of the safety emblem suitable for use on letterheads, booklets, and in advertising. May not be used directly or by implication to endorse or approve a commercial product. Members may use the words: "Member, National Safety Council" in conjunction with this registered trademark. Mats and proofs of the emblem in 1/2", 1" and 2" sizes, free.

## GREEN CROSS DECALS

The Green Cross for Safety emblem decal printed in white letters on green ground, with the words "MEMBER NATIONAL SAFETY COUNCIL" underneath in green, 2" in diameter. Also available without the wording. For use on office doors or windows. Emblems are available in 2" and 3" sizes.

## SAFETY PATCH

A travelling safety reminder. The Green Cross for Safety emblem for use on jackets, sweaters, shirts, caps, etc. Handsomely embroidered in washable green and white silk. 2 1/2".





### GREEN CROSS FLAG

Flown at half-staff, this SAFETY FLAG is a mournful announcement of a lost-time accident. Run to the top on accident-free days, it's a symbol of life free from the tragedies of accidents. Or award it to the department with the best record for the month. Any way you choose to use it, this FLAG adds drama and color to your program. Made of heavy-duty white sheeting, with the safety emblem centered on both sides in permanent color. 4' x 6'. Flame-proofed on request.

### AWARD PENNANTS

Available only to Award of Honor or Award of Merit winners, this attractive pennant is made of white, extra-heavy nylon. The safety emblem is of green nylon, anchor-stitched on both sides of the pennant. Pennant points are quilt-stitched to resist fraying due to wind whipping. 3' x 6'. Organizations which have won the Award of Honor or the former DSS Award in previous years may order stars showing the year each award was earned. Additional stars are also available for Award of Merit pennant.



### SAFETY DESK FLAG

Miniature silk flag—4" x 6"—on a jet black 10" staff with 1 3/4" base. The safety emblem is in emerald green on a white ground. Also effective as a banquet table decoration.

### AWARD DESK PENNANTS

Give your award "in plant" publicity with attractive, miniature, white silk reproductions of the Award of Honor or Award of Merit. Pennant is 3" x 6", on a black 10" staff with 1 3/4" base. Lettering in green. Available to Award winners only.



### 1956 SAFETY CALENDAR

It's a home study course in safety for workers, their wives and kids. Twelve heart-warming safety picture-stories, and twelve pages of 'round-the-clock safety tips—daily safety reminders that work both on and off the job. It's the one training aid you can put in their homes—that works for you day after day for a solid year!

The way the calendar contests pull in entries shows that everyone, from Junior to Grandma, is learning more safety—and liking it! The 1956 calendar has a brand new contest, "SAFETY SAYINGS," that promises to be more fun than ever before! Plan now to let the 1956 Safety Calendar help double the scope of your safety program. The earlier you order, the lower the cost. Write to the Membership Department for a free sample calendar and the full details.

# SAMMY—the dynamic, an



**MODEL "D"**  
9 inches high

The need for more showmanship to sell safety and safety organizations has become increasingly evident. Safety must compete for attention and interest, and the competition is getting tougher all the time. As "point-of-purchase" advertising material has increased in quality and quantity, safety messages have often suffered by direct or indirect comparison.

Sammy Safety, the Green Cross Kid, will help add the touch of razzle-dazzle which will attract proper attention to a serious safety message. By animating and personalizing the safety emblem Sammy also carries out a well-tested advertising principle—he'll help win quick recognition and emotional attachment for the Green Cross and for the safety movement which it emblemizes.

The advertising consultants and safety professionals who helped create the little fellow think SAMMY is a "natural"—exactly the gimmick that's needed to help put across ideas, direct attention to news, and whet the interest of passive observers in safety exhibits, bulletins and signs.

Specifications: All models are in full-color as shown on the front cover of this folder, printed on 60-pound coated stock, varnished, and mounted on .065 cardboard. All models have substantial, self-locking easels.



**MODEL "B"** 9 inches high

**MODEL "E"** 18 inches high

**MODEL "H"**—overall dimensions 18 inches by 23 inches. Slots cut in fence will accommodate posters or placards up to 8½ inches by 11½ inches. Punch-out holes will hold standard 4 inches by 9 inches or 4 inches by 6 inches pamphlet racks of the type normally used with perforated hardboard panels. Other items or materials may be mounted on the fence with paste or staples.

**MODEL "I"**—same as above, except right hand motorized to give pointing action. The simple trouble-free motor will normally operate several weeks on the standard dry cell included. Complete instructions are furnished.



# Animated emblem of safety



MODEL "A" 9 inches high

MODEL "C"  
9 inches high  
MODEL "G"  
24 inches high



MODEL "D-1" 9 inches high  
(without hat)

MODEL "F" 18 inches high  
(with removable hat)

The models are pre-packaged in kits to reduce packaging costs and facilitate handling. Kit packages cannot be broken. The kit numbers and their contents are:

## Kit

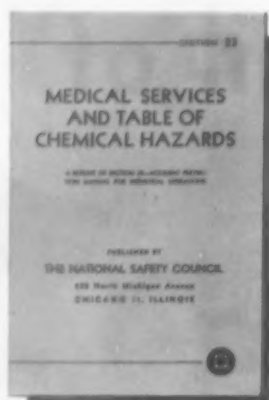
- 1—Five each of models A and B, per kit.....
- 2—Five each of models C and D, per kit.....
- 3—Five each of model E, per kit.....
- 4—Five each of model F, per kit.....
- 5—Three each of model G, per kit.....
- 6—Two each of model H, (without motion) per kit.....
- 7—One each of model I (with motion) per kit.....
- 8—One each of models A to H, per kit.....
- 9—Ten each of model D-1, per kit.....
- 10—Blank Easels, each.....

## PRICES • MEMBER AND NON-MEMBER

1-9	10-99	100 or more
\$5.25	\$4.25	\$3.95
5.25	4.25	3.95
5.25	4.25	3.95
5.25	4.25	3.95
5.25	4.25	3.95
5.25	4.25	3.95
6.50	5.50	5.15
7.75	6.50	6.00
5.25	4.25	3.95
3.75	2.75	2.50

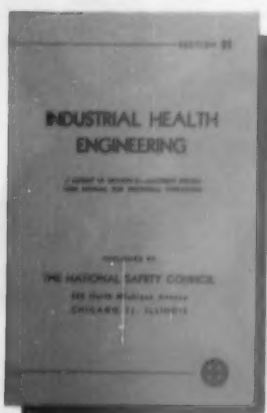
# MEDICAL SERVICES AND TABLE OF CHEMICAL HAZARDS

Types of services, medical records, physical medicine and rehabilitation; occupational diseases, mechanical vibration, repeated motion, noise, radiation, occupational infections, occupational skin diseases; table of chemical hazards. A reprint of Section 23—Accident Prevention Manual for Industrial Operations. 43 pages, 5 3/4" x 8 3/4".



# GET FIRST AID FAST

Accident Preventer 401, shows how minor cuts and bruises may result in serious illness without first-aid. Tells what to do in emergency for chemical burns, eye injuries, splinters, mild and serious burns. 2-color. 4 pages, 3" x 5".



# HEALTH ENGINEERING, INDUSTRIAL

How to maintain health standards in industry, through control of air contaminants, personal services, food services. A reprint of Section 21—Accident Prevention Manual for Industrial Operations.

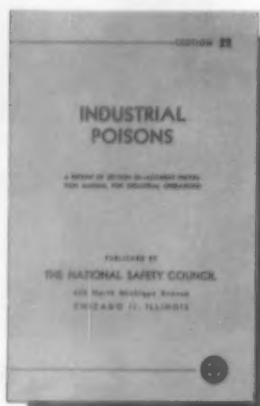


# IN THE PINK

A Ditzgen cartoon-illustrated booklet presenting basic rules for good health, with a fresh approach. Covers posture, sleep, eye and foot care, weight, cleanliness, and first aid. 16 pages, 3" x 5 1/2".

# POISONS, INDUSTRIAL

The characteristics, precautions for storage, handling and use, and emergency treatment for 96 industrial poisons, is treated in this booklet. A reprint of Section 22—Accident Prevention Manual for Industrial Operations. 34 pages, 5 3/4" x 8 3/4".



# DOWN TIME

Crammed with helpful facts that keep workers healthy and on the job. Deals with personal housekeeping, proper diet, relaxation and medical care. Fun to read, with lots of cartoons. 16 pages, 3" x 5 1/2".



# GET FIRST AID

Stresses the importance of immediate first aid for ALL injuries. Tells workers that a minor scratch—untreated—can result in a crippling injury; never take a chance. Photo-script. 16 pages, 3 1/2" x 6".



# STILL WAGGIN'

Encourages workers to get prompt first aid no matter how minor the scratch or injury. It is a new approach on the value of first aid, with amusing cartoons and short factual pointers. 16 pages—3" x 5 1/2".





#### FIFTEEN MINUTES TO GO

Dramatically compares the odds of getting an infection in a small cut or scratch with "Russian Roulette". They're in your favor, but would you take the chance. You'd have nothing to gain—everything to lose. Actual photos of wounds, burns, and scratches before and after infection lends the realism that will convince your workers that they're playing it smart if they invest "15 minutes" to get immediate medical attention. 15 minutes. (Class I Film)



#### OPEN FOR INFECTION

Warns against the dangers of neglecting even the smallest scratch and stresses the importance of workers receiving prompt first-aid treatment. 25 minutes. Black and white. 35mm sound slidefilm (Class I Film).



#### TO YOUR HEALTH

Brand new film intended to point out the advantages of complete examinations of workers before they go on a job. Designed for use of industrial nurses to interest student nurses in the problems of industrial health. 8 minutes. Black and white. 35mm sound slidefilm. (Write for prices.)

#### MEDICAL, FIRST AID, HEALTH AND SANITATION

Industrial Nurse, The—Member of the Safety Team—Reprint Gen. 18

Nursing Service in Industry—SPP Health 11

First-Aid Service in Industry—SPP Health 8

Get First-Aid Fast—Accident Preventer 401

Still Waggin'—Booklet

Only A Scratch—Safetygraph 14

Get First-Aid Fast—Photocopy

To Your Health—Film

Open For Infection—Film

Fifteen Minutes to Go—Film

First Aid—Talk 5 C & M

First Aid Kit—Decal S-8

Unit First Aid Kits—Data Sheet D-202

Put Down That Handkerchief—Talk 50 Book 5

What About Little Injuries?—Talk 41 Book 5

After You've Cared For the Victim—Talk 22 Book 3

First Aid (Minor Injuries)—SIC 233

What To Do in Case of Serious Injury—Talk 13 Book 2

Emergency First Steps—Talk 17 Book 3

When An Accident Happens—Talk 42 Book 5

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices



#### ONLY A SCRATCH

Safetygraph #14

Goes to work on how to get workers to use first-aid on little injuries. Shows how to treat different types of wounds such as punctures, lacerations, and incisions. Sells workers on the idea that protecting themselves against infection is a sign of good sense.

Reporting For First Aid—Talk 7 Book 1

Report Personal Injuries Promptly—Talk 11 Book 2

Injuries—Small Ones Too—SIC H109

First Aid and Rescue—Chemical Injuries—Talk 16 Book 3

Artificial Respiration (Schaffer)—First Aid Reminder

Artificial Respiration (Arm-Lift)—First Aid Reminder

Learn Artificial Respiration—Talk 12 Book 2

Artificial Respiration—SIC 165

Two Methods of Artificial Respiration—Safetygraph 23

Hip-Lift, Back-Pressure Method of Resuscitation—Talk 19 Book 3

Artificial Respiration—SIC 782

Back-Pressure, Arm-Lift Method of Resuscitation—Talk 18 Book 3

Artificial Respiration—SIC 781

Ice Rescue—Self Rescue—SIC 278

Rescue Work—SIC 258

Life Saving—SIC 223

Fractures—SIC 211

What To Do For Bruises, Sprains and Strains—How To Move An Injured Person—First Aid Reminder

Transportation of Injured Persons—Safetygraph 28

What To Do For a Broken Bone—First Aid Reminder

Don't Rush With an Injured Man—SIC 468

Practical First Aid—SIC 273

Practical First Aid—SIC 173

Practical First Aid—SIC 261

Mobile Stretcher—Detail Sheet 86

Emergency Stretchers—SIC 252

How To Control Bleeding—Safetygraph 26

How To Stop Serious Bleeding—Talk 20 Book 3

What To Do For Bleeding—First Aid Reminder

Practical First Aid—SIC 149

Nose Bleed—SIC 229

Practical First Aid—A Simple Tourniquet—SIC 73

Treating Shock—Talk 21 Book 3

Shock—SIC 284

What To Do For a Wound—For Shock—First Aid Reminder

Eye Injuries (Kuhn)—Reprint 46

Facts and Fallacies About Your Eyes—Reprint 53

What To Do and What Not To Do in First Aid and Emergency Care of Eye Injuries—Reprint 46

Eye Care!—SIC 811

Something in Your Eye—SIC 459

Back Injuries—SPP Health 17

Fracture of the Spine—SIC 518

Save Your Own Skin—Safetygraph 21

Skin Affections—SPP Health 10

Skin Trouble is Plenty Trouble—Reprint 55



#### SAVE YOUR OWN SKIN

Safetygraph #21

Discusses the causes and dangers of dermatitis. It shows workers how to protect their skin; the need for protective clothing, and for keeping it clean and in good condition; discourages the use of solvents, and encourages the use of protective creams, and first aid for all skin infections.



**TWO METHODS OF ARTIFICIAL RESPIRATION**  
Safetygraph #23

Large line drawings and clear-cut instructions simplify the job of teaching the Arm-Lift and Hip-Lift methods of artificial respiration. Safetygraph #23 is the only available visual training aid covering these methods, which are now officially accepted by virtually every national organization concerned with artificial respiration.



**FIRST AID TREATMENT FOR BURNS**  
Safetygraph #27

Discusses what to do for burns, frost-bite, radiation and electric burns, as well as chemical burns of the eye and skin.

Don't Get Dermatitis—Talk 23 Book 3  
Skin Care (For Women Workers)—SIC 606  
Oil and Greases—SIC 412  
Cutting Oils and Compounds—SIC 304  
Don't Wash With Solvents—Talk 14 Book 2  
Heat Cramps—Data Sheet D-247  
Sunstroke or Heatstroke—SIC 56  
What To Do For Heat Cramps, Heat Exhaustion, Sunstroke and Fainting—First Aid Reminder  
Heat Exhaustion or Heat Prostration—SIC 57  
Heat Exhaustion and Heat Cramps—SIC 197  
Heat Burns—SIC 196  
Sunburn—SIC 199  
Frostbite—SIC 145  
What To Do For Burns and Scalds—First Aid Reminder  
First Aid Treatment for Burns—Safetygraph 27  
Medical Services and Table of Chemical Hazards—Section 23 APM  
Emergency Treatment for Chemical Burns—Talk 46 Book 2  
Spills and Splashes—Solvents and Cutting Oils—Talk 14 Book 3  
Acid and Caustic Burns—SIC 75  
Ammonia Burns—SIC 361  
Creosote—Talk 14 C & M  
Creosote Burns—SIC 449  
Chlorine Poisoning—SIC 395  
Hydrocyanic Acid Gas—SIC 385  
Gas Asphyxiation—SIC 115  
Avoid Lead Poisoning—SIC 116  
What To Do For Poisoning—First Aid Reminder  
Death to Pests—Reprint 37  
  
Poison Ivy, Poison Oak, Poison Sumac—Data Sheet D-Gen. 17  
Poison Ivy, Poison Oak and Poison Sumac—Data Sheet D-304  
Poison Ivy—SIC 30  
Poison Oak—Poison Sumac—SIC 64  
Poison Ivy Eradication—SIC 414  
Snakes, Poisonous, of the U. S.—Data Sheet D-Gen. 19  
Snake Bites—SIC 201  
Black Widow Spiders—Data Sheet D-258  
Black Widow Spiders—SIC 250  
Black Widow Spiders—SIC 423  
Tick Bites—Data Sheet RR-1  
Tick Bites—SIC 516

Industry's Problem Children—Reprint Gen. 40  
Pre-Employment Examination of Construction Workers—Reprint Const. 6  
Placement, Not Exclusion—Reprint 48  
Selective Placement—Data Sheet D-234  
Physical Defects—SPP Health 13  
Physical Medicine in Industry—SPP Health 16  
Industrial Health Engineering—Section 21 APM  
In The Pink—Booklet  
In the Pink—SIC 815  
Down Time—Booklet  
Six Ways to Good Health—SIC 607  
Keeping Fit—SIC 141  
Enough is Enough—Talk 49 Book 4  
Act Your Age!—Talk 48 Book 4  
You Are What You Eat—Talk 47 Book 4  
Foot Comfort—SIC 316  
Athlete's Foot—SIC 422  
That Tired Feeling—SIC 168  
Headache—SIC 152  
Worry—SIC 148  
Recipe for Mental Health—SIC 604  
Hot Weather Safety Hints—Talk 52 Book 1  
Hot Weather Precautions—Tailboard Talk 9  
Why Take Salt Tablets?—Talk 15 Book 2  
Salt in Drinking Water—SIC 413  
Cold Weather Safety Tips—Talk 16 Book 2  
Common Cold, The—Talk 46 Book 4  
Common Cold, The—SIC 125  
Brush Painters—SIC 289  
Sanitation and Hygiene—SIC 308  
Industrial Dust—SPP Health 4  
Silica-Bearing Dusts—Reprint 8  
Talc and Other Dusting Compounds in the Rubber Industry, A Study of Workers Exposed to—Reprint Rubber 2  
Industrial Poisons—Section 22 APM  
Noise in Industry—Reprint Gen. 20  
Introduction to Radiosotopes—Data Sheet D-Gen. 45  
Public Relations Aspects of Industrial Wastes—Reprint Chem. 1  
Industrial Waste Disposal—SPP Chem. 7  
Use That Washing Machine—Talk 37 Book 5  
Drinking Water Dispenser—Detail Sheet 10  
Drinking Water on Construction Jobs—Data Sheet D-Const. 3



**HOW TO CONTROL BLEEDING**  
Safetygraph #26

The latest techniques for stemming capillary venous and arterial bleeding. Includes the latest research by the Committee of Medicine of the National Research Council.



**TRANSPORTATION OF INJURED PERSONS**  
Safetygraph #28

Covers examination of conscious and unconscious persons to determine spine or neck injuries, use of common industrial equipment to transport injured persons.



## YOU CAN TAKE IT WITH YOU

A humorous story of the worker who won't go home after a series of nerve-shattering home accidents. It takes a lot of doing, but the boss finally convinces him that he CAN take the plant safety program home with him; stop home accidents just like they do on-the-job. The film touches on all phases of home safety from housekeeping, ladders and electricity to lifting and home repairs. 13 minutes. Full color (Class III Film). Also 16mm sound-motion in full color (Class VI Film) or black and white (Class V Film).



## WHAT'S YOUR SAFETY I. Q.?

Aimed squarely at one of your hardest-to-get-at problems—the off-the-job safety of your workers. Using the popular "what's wrong with this picture" technique, this film gets your workers to thinking... talking about safety in the home, in traffic, and at play. After each set of pictures is flashed on the screen, the audience is given 15 seconds to spot the safety errors. They then check their answers as the narrator identifies the hazards; explains how to avoid them. 15 minutes. (Class I Film) Also 16mm sound motion. (Class V Film)†



## SAFE ALL AROUND

An off-the-job safety film dealing with the lethal hazards found in and around the home, showing workers how to spot them. Hazards are analyzed and methods for their elimination suggested. 18 minutes. Black and white. 35mm sound slidefilm (Class I Film).



## OFF-THE-JOB SAFETY Safetygraph #20

Doesn't mince words. It is designed to help stop the off-the-job accident toll, at home, in recreation and in traffic. It illustrates hazards to watch out for, and makes workers stop, think and watch their step—and play it safe off-the-job.

## OFF-THE-JOB SAFETY KIT

A packet prepared by the Off-The-Job Safety Committee to help safety men put across a program to both management and employees. Contains about 85 items—booklets, instruction cards, planning material, sources, of help, posters, and other materials. Write for information.

## OPERATION SAFETY

Each month a complete kit of safety education program materials is prepared on a different theme for use in continuing state and local safety education programs. Each kit contains a program planning guide, fact sheets, pattern news releases, radio scripts and spots, speakers aids, background information, sample leaflets, miniature reproductions of suitable posters available, and other items all selected to promote the phase of traffic safety emphasized in the particular kit. Operation Safety is sent to Traffic members of the National Safety Council as a part of their membership service, and is available to anyone desiring the service on subscription.

Operation Safety Leaflets are available for each theme and may be purchased with or without imprint.

Traffic Posters parallel Operation Safety themes in subject matter.

## OFF-THE-JOB

Off-The-Job Safety—Safetygraph 20  
Off-The-Job Safety Kit  
Off-The-Job Accidents—SPP 202  
Off-The-Job Safety—Talk 4 Book 2  
After Work—Talk 44 Book 5  
Take It Easy!—Talk 46 Book 5  
You Can Take It With You—Film  
Safe All Around—Film  
What's Your Safety I.Q.?—Film  
Follow the Leader—Booklet  
Hold Everything—Booklet  
Vacation Daze—Booklet  
So You're Going On a Vacation—Booklet  
Enjoy Your Vacation—SIC 221  
Have a Holiday—Leaflet  
A Three Day Weekend—Leaflet  
Thanks For a Safe Year—Leaflet  
Summer Camp—SIC 320  
Swimming—SIC 329  
Small Boats—SIC 337  
Going Fishing?—SIC 404  
Hunting Cautions—SIC 451

Andy Larkin—Booklet  
The Driver's Lucky Seven—Booklet  
Highway Zoo—Booklet  
Mac Hines—Trooper—Booklet  
Your 10,000 Mile Living Room—Booklet  
Day-Glo Dash Stickers  
Defensive Driving—Talk 51 Book 3  
If You Drive—Talk 52 Book 4  
Drivers' Ten Commandments—SIC 829  
Drive Both Cars—SIC 827  
Look Sharp—SIC 831  
Safe Speed—SIC 825  
Business of Driving, The—SIC 390  
After the Motor Car Accident—SIC 183  
Motor Vehicle Inspection—SIC 225  
Traffic Lanes—SIC 424  
Traffic Intersections—SIC 432  
Crossing the Tracks—SIC 826  
Glare on the Highway—SIC 415  
What is Blind Driving?—SIC 383  
Traffic Right-of-Way—SIC 346  
Hidden Traffic Hazards—SIC 497  
Driving Motor Vehicles at Stop and Go Lights—SIC 494  
Traffic Hand Signals—SIC 335

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices

Loose Gravel Hazards—SIC 398  
 Driving at Night—SIC 378  
 Night Driving is Different—SIC 830  
 Your Reaction Time—SIC 368  
 Driving Vehicles—SIC 186  
 Motor Vehicle Stopping Distances—SIC 216  
 Delayed Braking—SIC 405  
 Rear-End Collisions—SIC 529  
 Skidding Can Be Avoided—SIC 367  
 When Tires Blow Out—SIC 377  
 Proper Tire Inflation—SIC 406  
 Fog—Rain—Snow—SIC 828  
 Fatigue at the Wheel—SIC 479  
 Children and Traffic—SIC 327  
 Carbon Monoxide—SIC 357  
 If You Walk—Talk 51 Book 4  
 Pedestrian Traffic Safety—SIC 313  
 Hazards to Children—SIC 338  
 Get Home Safely—SIC 158  
 Safe At Home—Booklet  
 Safety 'Round the Clock—Booklet  
 Take Safety Home—Talk 52 Book 3  
 Hazards At Home—SIC 129  
 Home Practices Checklist—SIC 581  
 Home Conditions Checklist—SIC 582  
 Fall Hazards At Home—Talk 50 Book 3  
 Prevent Home Falls—SIC 330  
 Home Basements—SIC 477  
 First-Aid Kit for the Home—SIC 416  
 Home Cooking Hazards—SIC 391  
 Home Electric Appliances—SIC 384  
 Portable Electric Lamps—SIC 370  
 Bathroom Hazards—SIC 407  
 Protect the Small Child—SIC 359  
 Garden Tools—SIC 314  
 Home Outdoor Hazards—SIC 321

#### SAFE AT HOME

This all new edition is packed with suggestions for eliminating hazards in every room of the house. Lists safe practices and danger signals and includes section on safety for children and the aged. 2-color, 16 pages, 4" x 7¼".



#### SAFETY 'ROUND THE CLOCK

Extends interest in safety to the home and to the worker's family. It gives hour by hour hints on home safety, from the time to rise until the cat is put out for the night. Cartoon illustrated. 8 pages—3½" x 8".

#### FOLLOW THE LEADER

Re-teaches the cardinal points of job safety, shows the worker how these same points can protect him while off the job, and impresses him with the great job industry does in keeping him safe while at work. 8 pages—3¼" x 8".



#### HOLD EVERYTHING!

Deals with accidents in the home, on the street, at play, on summer vacations. Includes an interesting self-test for checking hazards in the worker's home, and a "What's Wrong With This Picture?" traffic quiz. 16 pages—4" x 7".

#### VACATION DAZE

An attractive and readable off-the-job booklet that humorously illustrates how to avoid vacation accidents—on the road, in the country, near water, and at home. 4-color, 8 pages. 3⅞" x 8".



#### SO YOU'RE GOING ON A VACATION

An attractive, readable booklet for vacation bound employees. Presents safety tips on motoring, swimming, hunting and camping. Shows workers how to have fun while avoiding vacation hazards. Full color, 8 pages, 4" x 8".



# HAVE A HOLIDAY

A holiday send-off leaflet that does double duty—expresses warm holiday wishes and reminds workers to return to the plant safe and sound both at Christmas and New Years. Cleverly illustrated in 2 colors. 4 pages, 3" x 5 1/8".



# ANDY LARKIN

Andy Larkin, a veteran ambulance driver show a new driver how to drive safely to observe the rules of the road, and the reasons for following them, in this four-color comic book. 16 pages. 6 3/4" x 10".



# A THREE DAY WEEKEND

Tells your employees that you want their Labor Day weekend to be full of fun—but that you want them to come back to the job safe and sound. 2-color, 4 pages, 3" x 5 1/8".



# HIGHWAY 100

A clever cartoon booklet, showing that animals are the craziest people—when they act like people. These hilarious characters point out driver faults common to today's traffic. Ideal for off-the-job safety programs. 4-color, 16 pages. 3 3/4" x 8".

# THANKS FOR A SAFE YEAR

A holiday leaflet that expresses to your employees thanks for working safely and a wish that the coming year will also be a safe one. 2-color, 4 pages. 3" x 5 1/8".



# MAC HINES—TROOPER

An unusual comic-type traffic safety booklet that forcibly illustrates how and why accidents happen and what can be done to help avoid them. Everyone who sits behind the wheel of a car should have a copy of this booklet—especially the teen age drivers. 4-color, 16 pages. 6 1/2" x 10 1/2".



# YOUR 10,000 MILE LIVING ROOM

A new slant on safety. Common sense captions drive home the need for courtesy, safe speed, good manners and safe practices to prevent costly accidents both at home and on the road. 12 pages, 3" x 6".



# THE DRIVER'S LUCKY SEVEN

Shows that driving a car needn't be a gamble. You can make your own luck by: keeping the car safe; holding down speed; stopping, looking and listening; being in shape to drive; passing with care; and other steps. 8 pages—3 1/2" x 8".

Most of the materials prepared by the various special industry groups represented in the Council's industrial membership are applicable to one or more other industries. For that reason most of the special industry publications have been included in the subject index on the preceding pages. Those subjects likely to be of interest to a single industry or occupation are listed on the following four pages.

## OFFICE WORKERS

Poster Packet, Office Safety—Set of 12  
Office Safety—SPP 108  
Look Out for Office Accidents—Reprint 49  
Butter Side Down—SIC 807  
Office Files—SIC 806  
What Goes Up . . . —SIC 801  
On Your Way—SIC 803  
Playing Horse—SIC 805  
Lifting—for the office staff—SIC 800  
Window Trouble—SIC 814  
Safety in Offices—SIC 603  
Deadly Weapons?—SIC 804  
Finger Tips—SIC 812  
Pens and Pencils—SIC 272  
Pins—SIC 810

## AIR TRANSPORT

Air Terminal Vehicular Traffic Safety Guide—Data Sheet D-230  
Automotive Equipment Operators on Airport Ramps—Data Sheet D-A 2  
Aircraft Ground Fuel Servicing Fire Hazards—Data Sheet D-A 4  
Electrical Grounding of Airplanes—Data Sheet D-294  
Hangar Housekeeping—SIC 717  
Aircraft Portable Work Stands and Ladders—SIC 716  
Mobile Ramp Equipment—SIC 715  
Jacking Airplanes—SIC 714  
Taxiing Aircraft—SIC 713  
Towing Aircraft—SIC 712

## AGRICULTURE

**FARM SAFETY REVIEW**—A national farm safety magazine especially for agricultural leaders. Contains new ideas, materials and program helps. Published bi-monthly. One-year subscription, \$1.00; quantity rates on request.

Farm Safety Demonstrations—28 pages, 5 1/2" x 8 1/2"  
Farm Safety Discussions—36 pages, 5 1/2" x 8 1/2"  
Farm Safety Plays—52 pages, 5 1/2" x 8 1/2"  
Farm Safety Exhibits—4 pages, 5 1/2" x 8 1/2"  
Tractor Facts—4 pages, 5 1/2" x 8 1/2"  
Face the Facts—illustrated farm accident statistics, 4 pages 5 1/2" x 8 1/2"

The Origin and Progress of Farm Safety Education—8 pages, 5 1/2" x 8 1/2". Single copy free.

Weed Out the Hazards—4 pages, 5 1/2" x 8 1/2"

A Safety Color Code for Agriculture—leaflet

Check Your Safety I.Q.—4 pages, 5 1/2" x 8 1/2"

Make Your Farm Safe—6 pages, 4" x 8 1/2"

Are You Inviting Corn Picker Accidents?—43 frame, 35mm silent film strip and script.

Do You Know?—33 frame, 35mm silent film strip and script

Safe Farm Practices Leaflets—a series on safe methods for specific farm jobs; illustrated; 4 pages, 5 1/2" x 8 1/2". Subjects are:

- Accidents and Family Relationships
- Animal Diseases and the Family
- Current Follies (electricity)
- Damp Hay Starts Fires
- Driving Tips for Farmers
- Electric Fence Problems
- Farm Fire Prevention
- Farm Home Accidents
- First Aid

- First Aids in Fire Fighting
- Hand Tools
- Heat Lamp Brooding
- How to Lift
- How's Your Horse Sense?
- Insecticides
- Is Your Electric Fence Safe?
- Is Your Farm Home Fall-Proof?
- Ladder Safety
- Let's Hunt Safely
- Lightning Protection
- Live to Pick Another Year
- Make Barn Chores Safe & Easy
- Petroleum Products
- Pitchforks Are Dangerous
- Power Shaft Shields
- Rural Women's Role in Safety
- Safe-Easy Tractor Operation
- Safe Farm Driveways
- Safe Livestock Handling
- Safeguarding Home Electric Services
- Safe in the Saddle
- Safety Bull Pen
- Use an Approved Safety Can
- Water Safety

## CEMENT AND QUARRY

**Safety in Quarry Operations**—This authoritative manual provides all the basic information for setting up and operating an effective safety program. Included are sections on safety organization and accident investigations, technical discussions on drilling, safe storage and use of explosives, quarry railways, truck transportation in quarries, and use of mechanical equipment. 48 pages, 6" x 9".

**Jackhammer Safety—35mm Silent Filmstrip**—Illustrates the standard safe practices in drilling and blasting operations. Stresses the importance of keeping the jackhammer in good condition; protective equipment for the operator. (Class II Film).

Jackhammers in Quarries—Data Sheet D-C & Q 1

Quarry Safety Shelter—Detail Sheet 113

Cement Rock Quarrying and Crushing—SPP Cem. 1

Falling or Sliding Rock in Quarries—Data Sheet D-C & Q 2

Cement Burning—SPP Cem. 3

Raw and Finished Cement Mill Grinding—SPP Cem. 2

Cement Mill Shops—SPP Cem. 4

Storing, Packing and Shipping Cement—SPP Cem. 5

Cement Mill Yards and Railroads—SPP Cem. 6

## COAL MINING

**Blasting Safely in Mines—35mm Silent Filmstrip**—Demonstrates the know-how and skill necessary in using explosives. Shows how and where to store explosives—the precautions that must be taken. (Class II Film).

**Safe Haulage in Coal Mines—35mm Silent Filmstrip**—Covers all the safety factors involved in haulage operations. Stresses the importance of car and motor maintenance. Interest is heightened with real accident scenes. (Class II Film).

**What Should A Mine Safety Inspector Look For?**—Reprint Coal Mining 1

Coal Mine First Aid Facilities—Data Sheet D-Min. 6

Grounding Electric Equipment in Coal Mines—Data Sheet D-Min. 1

Hookup of Main Line Switch Signals—Detail Sheet 110

Mist Projector—Detail Sheet 104

Underground Storage of Lubricants in Coal Mines—Data Sheet D-268

Prevention of Falls Down Openings in Mines—Data Sheet D-Min. 11

Falls of Persons—SIC 631

Pit Guard—Detail Sheet 76

Electric Blasting Underground (in Coal Mines)—SPP CMST 9-3-1

Handling Misfires—SIC 544

Equipment Cart for Roof Bolting in Mines—Detail Sheet 109

Pipe Support for Roof Bolting Sections in Mines—Detail Sheet 108

Wire Hanger for Roof Bolting Sections in Mines—Detail Sheet 106

What Do We Actually Know About Roof Testing?—SPP CMST 7-1-1

Testing Mine Roof—SIC 387

Setting A Prop—SIC 628

Timbering With Props and Cap Pieces—SIC 27

Barring Down Loose Material From Above—SIC 380

Handle for Stoper—Detail Sheet 94

Hand Guard for Short Stoper in Mines—Detail Sheet 107

Cover Over Handle of Stoper—Detail Sheet 93

Cutting Machine Operators—SIC 648

Cutting and Loading Machines in Coal Mines—Data Sheet D-Min. 9

Cutting and Loading Machines—Operation—SIC 548

Cutting and Loading Machines—Care—SIC 547

Cutting and Loading Machines Trailing Cables—SIC 546

Loading Machine Operators—SIC 647

Loading and Tamping—SIC 394

Safety Specifications for Locomotives in Coal Mines—Data Sheet D-262

Shuttle Car Operation—Data Sheet D-Min. 8

Seat on Mine Car for Brake Man—Detail Sheet 113

Motormen in Mines—SIC 629

Motormen in Mines—SIC 630

Shuttle Car Operators—SIC 646

Man Cage Operation—SIC 420

Manlifts—SIC 549

Use of Mantrips—SIC 375

Link and Pin Couplings—SIC 46

Working Around Mine Trains—SIC 639

Brakemen in Mines—SIC 638

Miners at Working Places—SIC 625

Blocking Cars in Mine and Quarry—SIC 448

## ELECTRICAL EQUIPMENT

Stranding of Communication and Power Cable—Data Sheet D-EE 2

Cathode Ray Tubes—Data Sheet D-240

## FOOD

Safety in Canning Industry—Reprint 56

Distilleries—SPP F-6

Distilleries—SPP F-7

Distilleries—SPP F-8

Glass Bottle Cases—SIC 680

Bottle Washers—SIC 682

Ice Handlers—SIC 410

Ice Processing Machines—SIC 490

## HOSPITAL

**Hospital Safety Service**—The American Hospital Association and the National Safety Council offer an accident and fire prevention service providing the basic materials and techniques needed for a sound, practical program to combat personal injury, fire, equipment damage, and other accident losses. Write for information.

**Hospital Safety Manual**—A guide for use by hospital administrators and department heads to help in the prevention of injury and occupational disease to persons and damage to property through accidents and fire in hospitals and institutions. Stresses employee and patient health and safety. 6" x 9", 116 pages.

## LOGGING

**In the Clear**—A booklet written especially for loggers, on how to prevent accidents in the logging industry. Clever "wrong-way" illustrations combined with serious text warn against hazards such as slipping, falling trees, improper handling of materials and accidents due to saws, axes and moving machinery. 2-color. 8 pages, 4 1/2" x 8".

**L'Abri (In the Clear)**—French Edition

**Message for Woods Bosses**—Written in the language of loggers, this booklet gives the woods boss the basic principles on how to prevent accidents in the saw log and pulp wood logging industry. Gives pointers on how to handle men successfully. 2-color. 12 pages, 3 1/2" x 6".

**Message for Woods Bosses**—French Edition

**Poster Packet—Logging (English)**—Set of 12

**Poster Packet—Logging (French)**—Set of 12

**Pulpwood Logging**—SPP PP 3

**Felling Pulpwood Trees**—SIC 672

**Log Crane or Derrick Operator**—SIC 793

**Logging Tractors**—SIC 787

**Operating Logging Tractors**—SIC 788

**Log Skidding With Tractors**—SIC 791

**Loading Logging Trucks**—SIC 790

**Loading Logging Trucks**—SIC 789

**Log Hauling with Trucks**—SIC 786

**Unloading Logging Trucks**—SIC 660

**Log Haul-Up and Log Deck**—SIC 794

**Skidding and Bunching Logs with Horses**—SIC 668

**Log Hooker or Choker Setter**—SIC 792

**Logging Wedges**—SIC 667

**Log Driving**—SIC 665

## LUMBER MANUFACTURING

**Sawmill Safety—35mm Sound Slidefilm.** A mill superintendent's tour of the plant with a new worker sets the stage for a job-by-job summary of safety in all phases of sawmill operations. He is shown the precautions the head sawyer, dogger and tail sawyer must take—how their jobs affect the safety of every man on the crew. He's then shown the pond and what's done there to prevent injuries. Back in the mill, the superintendent emphasizes the importance of keeping guards in place; the safe practices in using or working near edgers, cutoff saws, small pull saws, planers, piling machines and carriers. 17 minutes. (Class I Film).

**Veneer Clipper Guard**—Detail Sheet 145

**Veneer Lathe Operator**—SIC 798

**Veneer Clipper Operator**—SIC 799

**Log Carriage Block-Setter and Dogger**—SIC 795

**Lumber Handling and Piling**—Data Sheet D-345

**Lumber Edger Operator**—SIC 796

**Lumber Trimmer Operator**—SIC 797

## MARINE

**A Safety Manual for Marine Oil-Fired Watertube Boilers.** Completely covers general operation and maintenance and repair, from placing the boiler in service to laying up boilers. Particular emphasis is placed on all the principles of safety involved in operation, maintenance and repair. Includes discussion of specific safe practices and of fire prevention. Illustrated. 72 pages, 6" x 9".

**Poster Packet—Marine**—Set of 12

**Marine Boilers**—SPP Mar. 2

**Stevedoring**—SIC 436

## MEAT PACKING, TANNING AND LEATHER PRODUCTS

**Hand Care**—SIC 555

**Shoe Manufacturing**—SIC 418

**Smoke Ovens**—SIC 554

**Overhead Trolleys**—SIC 556

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices

## METALS

- Foundries—SPP 73
- Handling Materials in Foundries—SIC 485
- Metalizing—Data Sheet D-Mo. 29
- Handling Molten Metal with Hand Ladles—SIC 512
- Babbitting—SIC 139
- Cupola—SIC 509
- Cupola Safe Practices—SIC 510
- Cupola Safe Practices—SIC 511

## MINING (other than coal)

- Bar It Down—35mm Silent Filmstrip. Deals with the most outstanding hazards found in most mining operations—falling rock or ore from drifts, stopes, and similar openings. Right and wrong methods of removing loose ore or rock are emphasized. Includes pictures of barring down under timber protection, using different length bars for different operations, standing clear of loose materials, etc. (Class II Film).
- Falling Ground—35mm Sound Slidefilm. Deals with prevention of rock and ore falling from back and sides of mine openings—the biggest hazard in the mining industry. Shows safe practices in detecting "loose", taking it down, and supporting it. (Class I Film).
- Detecting Loose Rock or Ore—Data Sheet D-Min. 3
- Testing Back, Ribs and Face—SIC 584
- Testing, Removing and Supporting Loose Rock—Data Sheet D-272
- Falling Rock—SIC 697
- Stulls—SIC 634
- Electric Blasting in Sinking Shafts—Reprint Mining 6
- Blasting From Electric Power Circuits—Data Sheet D-293
- Drilling Blast Holes Safely with Churn Mills—Data Sheet D-200
- Safety in Open Pit Blasting—Reprint 45
- Stray Currents in Electric Blasting—Data Sheet D-289
- Grounding Electrical Equipment at Open Pit Iron Mines—Reprint Mining 2
- Drilling in Mines—Data Sheet D-273
- Setting Up and Drilling—SIC 626
- Jackhammer Operators—SIC 695
- Details and Assembly of Selamour Chute—Detail Sheet 81
- Chute Pullers in Mines—SIC 644
- Hung-up Chute—SIC 627
- Emergency Stop for Belt Conveyor in Case of Roof Falls—Detail Sheet 74
- Chute Platforms and Car Stop—Detail Sheet 82
- Mine Car Dumping Devices and Chute Bar—Detail Sheet 83
- Earthing System for Headgears—Reprint Mining 7
- Sheave Grinding Arrangement—Detail Sheet 116
- Circuit for Dead Man Control on Mine Locomotives—Detail Sheet 80
- Safe Operation of Rocker-Type Loading Machines in Mines—Data Sheet D-209
- Safety in Scraping Operations in Mines—Data Sheet D-201
- Cagers in Mines—SIC 642
- Hoistmen in Mines—SIC 643
- Motormen in Mines—SIC 583
- Shaftman—SIC 645
- Grizzly Men in Mines—SIC 640
- Raises—SIC 636
- Stopes—SIC 635
- Slusher Operators in Mines—SIC 641
- Slusher Blocks and Ropes—SIC 585
- Shift Bosses—SIC 633
- Handling Tools and Material—SIC 632
- Winzes—SIC 637
- Working Around Mine Trains—SIC 639
- Brakemen in Mines—SIC 628
- Miners at Working Places—SIC 625
- Blocking Cars in Mine and Quarry—SIC 448

## PETROLEUM

- Poster Packet—Petroleum—Set of 12
- Lubricating System for a Well Drill Sheave Block—Detail Sheet 134
- Gasoline Service Station—SIC 381
- Gasoline Service Station—SIC 376
- Gasoline Service Station—SIC 351
- Refueling Motor Vehicles—SIC 365

## PRINTING AND PUBLISHING

- Safety Manual for the Graphic Arts Industry—The first complete, authoritative manual for the Graphic Arts Industry—representing the best safety know-how available. Shows how to stop accidents, gives the how to, whys, and results of successful safety programs in the printing industry. Explains what stopping accidents will mean in terms of production, efficiency, worker morale and reduced costs . . . "must" reading for plant owners, managers, foremen. 96 pages, 6" x 9".
- Poster Packet—Printing and Publishing—Set of 12
- Analysis of Injury Experience of a Large Printing Plant—Data Sheet D-205
- Slug Casting Machines—Data D-PRN 1
- Solvents Used in Lithography—Reprint 44
- Safety Toe Guard for a Flat Bed Miehle, Cylinder Printing Press—Detail Sheet 131

## PUBLIC EMPLOYEE

- Public Employees—SPP MUN-1
- State Highway Employees—SPP Hy-1

## PUBLIC UTILITIES

- 30 Tailboard Talks—described on page 18
- Minute Men—35mm Sound Slidefilm. Dramatizes the hazards involved in the work of utility company linemen—the safety precautions they must observe. "Service with Safety" is the slogan of the utilities industry, and they back it up with extensive safety training. The film illustrates a typical training program—the safe practices stressed. Covers: how to safely climb a wooden pole, how to work on top of the pole, the use and care of protective equipment, how to use a grounding stick, etc. 20 minutes. (Class I Film).
- Capacitors—Data Sheet D-PU 3
- Capacitors—SIC 610
- Plan a Safe Job at the Tailboard—Reprint PU 1
- Volts and Jolts—Reprint 54
- Atmospheric Conditions in Underground Structures—Data Sheet D-250
- Working on De-Energized Station Equipment—SIC 492
- Handling Poles—SPP PU 4
- Setting or Removing Poles in or Near Energized High Voltage Conductors—Data Sheet D-PU 4
- Dismantling Defective Poles—SIC 45
- Dismantling Defective Poles—SIC 169
- Test Doubtful Poles—SIC 232
- Pole-Top Resuscitation—Data Sheet D-PU 1
- Improved Methods of Pole-Top Resuscitation—Reprint 42
- Pole-Top Rescue—SIC 464
- Handling Pipe—SIC 502
- Hot Line Tools—Data Sheet D-PU 2
- Linemen's Belts—SIC 288
- Climbers for Linemen—SIC 491
- Sharpening Linemen's Climber Gaffs—SIC 22
- Linemen's Rubber Protective Equipment—SPP PU 3
- Safety Lines—SIC 96
- Protection Against Grounded Wires—SIC 352
- Rescue from Manhole—SIC 617
- Working in Manholes—SIC 445
- Manhole Ventilation—SIC 429
- Tree Trimming—Data Sheet D-244
- Tree Trimming—SIC 392
- Tree Trimming—SIC 205
- Changing Gas Motors—SIC 683
- Gas and Electric Meter Readers—SIC 373
- Vicious Dogs—SIC 175

## PULP AND PAPER

- Fire Prevention on Pulpwood Logging Operations—Reprint PP 1
- Tools for Manual Handling of Pulpwood and Logs—Data Sheet D-292
- Unloading Pulpwood at the Mill—Data Sheet D-PP 8
- Cleaning Beater Back-Falls—SIC 507
- Beaters—SIC 566



Pulp Digesters—SIC 565  
 Pulp Digesters—SIC 564  
 Pulp Mill Digesters—Data Sheet D-PP 10  
 Pocket Grinders—SIC 567  
 Magazine Grinders—Charging—SIC 568  
 Pulp and Paper Mill Safety—SPP PP-1  
 Loading Paper in Railroad Cars or Motor Trucks—SIC 527  
 Pulp or Wood Hooks—SIC 570  
 Pulpstones—SIC 673  
 Acid Plant, The—Data Sheet D-210  
 Caustic Liquor Room, The—Data Sheet D-214  
 Pulp Stock Chests—SIC 561  
 Paper Machines—Data Sheet D-290  
 Paper Finishing Room—SIC 562  
 Manufacturing Standard Paper Bags—Data Sheet D-PP 6  
 Paperboard Box Manufacturing—SPP PP 2  
 Boxboard Machine Operation—SIC 500  
 Pressure Vessels, Unfired and Piping in Pulp Mills—D-243 (Data Sheet D-PP-11)  
 Carton Stitcher—SIC 569  
 Safety Levers on Carton Punching Press—Detail Sheet 87  
 Langston Printer-Slotter, Feed Roll Guard for—Detail Sheet 127  
 Printer-Slotters—Data Sheet D-PP 15  
 Drum-Type Reels—Data Sheet D-278  
 Cutting Paper Cores—Data Sheet D-PP 9  
 Handling Shafts and Cores—Data Sheet D-PP 8  
 Cutting Paper from Cores—SIC 526  
 Paper Roll Skinners—Detail Sheet 78  
 Stacking Paper Rolls—SIC 498  
 Roll Scraper—SIC 34  
 Handling Paper Rolls—SIC 499  
 Roller Tool for Threading Paper Calenders—Detail Sheet 62  
 Reel Spools, Machined Ends of—Detail Sheet 128  
 Wrap Roll, Arm Extension for—Detail Sheet 129  
 Wood Rooms—Data Sheet D-PP 13  
 Washing and Turning Wet Felts—SIC 508  
 Brake—SIC 563

## RAILROAD

**Safe Railroader**—Popular magazine for railroad workers now published monthly in a new 8 page format. Patterned after the SAFE WORKER, it makes liberal use of cartoons, common sense safety rules and humorous stories to win employee interest. It is suitable for all railroad men—engineers, firemen, trainmen, shop and maintenance of way personnel. 3½" x 5½".

**Keep 'Em Rolling—35mm Sound Slidefilm.** There's a lot of behind-the-scenes preparation before freight cars get the go-ahead signal. Here's a film that will tell your car men both the big things and little things they have to do to protect themselves and others from injury. 15 minutes. (Class I Film).

**Men of Maintenance—16mm Sound Motion or 35mm Sound Slidefilm.** Deals with the diversified safety problems of the men who construct and maintain the roadbeds, buildings, bridges and signals. Stresses the safe practices relating to motor track cars: operation, inspection, emergency signal equipment, loading and placing of tools, getting the car on and off the track, safe use of all the basic tools and equipment. 15 minutes. (Class I Film).

**Men and Motive Power—35mm Sound Slidefilm.** Shows that while the railroad round house is a busy place, it can be a safe place too, if everyone observes the fundamental safety rules. 15 minutes. (Class IV Film).

**Safely We Work—16mm Sound Motion or 35mm Sound Slidefilm.** Long years of experience have established the safe ways of doing every job in railroading. Moving quickly from point to point, the film is aimed at the fundamentals you want your new workers to learn. 15 minutes. (Class VIII Film).

**Close Clearance—Booklet**

Handling Locomotive Appurtenances—Data Sheet D-222

Thawing Frozen Ladings—Data Sheet D-RR 6

Changing Out Railroad Car Wheels—Data Sheet D-242

Safety Chain for Locomotive Wheels—Detail Sheet 66

Air Hose Coupling Hooks—Detail Sheet 55

Standard Railroad Signals—SIC 707

Sliding Rail Brake—Detail Sheet 68

Freight Car Doors—Data Sheet D-RR 5

Railroad Track Cars—SPP RR-1

Operating Railroad Switches—SIC 769  
 Safety in Railroad Yards—SIC 767  
 Railroad Shop Moves—SIC 662  
 Railroad Pits—SIC 765  
 Railroad Drop Pits—SIC 664  
 Power Adzing Machines—SIC 619  
 Handling Creosoted Ties, Poles and Timbers—SIC 411  
 Railroad Safety—SIC 374  
 Using Track Wrenches—SIC 311  
 Operating Hand Brakes—SIC 779  
 Coupling and Uncoupling Railroad Cars—SIC 768  
 Jacking Railroad Equipment—SIC 766  
 Crossing Railroad Tracks—SIC 663  
 Bridge Painting—Data Sheet D-296

## RUBBER

Medical Problems Encountered in the Manufacture of American Made Rubber—Reprint Ru. 1

Compounding Materials Used in the Rubber Industry—SPP Ru. 1, Part 1

Rubber Mills—SIC 591

Rubber Mills—SIC 590

Vulcanizers and Devulcanizers—SPP Ru. 2

Vulcanizers—SIC 594

Windups and Letoffs—Data Sheet D-281

Tire and Tube Curing—Data Sheet D-Ru. 2

## TEXTILE

**Woven With Safety—35mm Sound Slidefilm.** The safety committee of a large textile mill meets and agrees that it's the little things that cause most of the accidents; that they can be stopped if the fundamental rules are heeded: never clean, repair or adjust the parts of a machine while it is moving; keep guards in place; keep knives and scissors where they belong; lift properly; don't wear loose clothing near machines. 15 minutes. (Class I Film).

Cotton Mills—SPP T-1

Textile Mills—SIC 750

Cotton Looms—Data Sheet D-279

Weaving—SIC 758

Spinning—SIC 751

Wool Spinning—SIC 763

Cotton Pickers—Data Sheet D-276

Opening and Picking—SIC 756

Wool Pickers—Data Sheet D-265

Wool Picking—SIC 764

Cotton Cards—Data Sheet D-227

Cards—SIC 755

Wool and Worsted Cards—Data Sheet D-295

Wool Carding—SIC 762

Cotton Slashers and Auxiliaries—Data Sheet D-223

Slashers—SIC 757

Textile Bleaching Compounds—Data Sheet D-T 1

Textile Bleaching Compounds, Safety in Using—SIC 517

Cloth Shears—Data Sheet D-291

Garnetting Machines—Data Sheet D-T-10

Shuttle Guard—Detail Sheet 58

Dye House—SIC 760

Cloth Room—SIC 759

Cotton Gin Operators—SIC 513

Lappers and Combers—SIC 754

Spooling and Warping—SIC 753

Drawing and Fly Frames—SIC 752

Wool Finishing—SIC 761

Windup Operations—SIC 780

See Page 1 for code to abbreviations

See pages 66 to 69 for Index and Prices

## CONDITIONS AND TERMS

Prices shown in this catalog are effective February 15, 1955, payable U. S. Funds. They are subject to change without notice.

All prices shown are based on a single order for delivery in one shipment to one destination (one shipment per month on annual subscriptions). Quantities are not cumulative over a period of time, or for a number of locations, to obtain quantity prices.

All prices unless otherwise shown are pre-paid destination within the United States and Canada and Pan American Union. Customs charges will not be paid by the Council. An additional charge equal to 4% of the order will be made on shipment to foreign countries.

Terms of payment on all invoices are 30 day net, except quantity calendar purchases. Annual subscriptions payable in advance.

Remittance should accompany all orders totalling one dollar or less to conserve labor and speed up handling of the order.

Single copies of monthly publications—12 issues annually—can be purchased at 1/10 the annual subscription rate.

Special sorting or packaging, trimming to special sizes or other special handling of publications will, wherever possible, be performed as requested. Service charges will be made for the cost of such work.

## IMPRINTING CHARGES

Imprinting can be done on all Council publications (outside front and back covers only) provided there is sufficient space and a light background color.

In general, imprinting is limited to three lines. On large posters, imprinting is limited to the right hand half of the lower margin. It is understood that a quantity within 4% above or below the quantity requested will constitute an acceptable delivery on any order requiring imprinting.

Imprinting at time of publication:

Safe Driver, Safe Worker, and all other publications imprinted at time of publication (except calendars), regardless of quantity—per lot or per month on monthly publications.....\$2.00

On monthly publications, the per lot-per month charge of \$3.50 is effective only when the imprint remains the same during the period of subscription.

Imprinting after publication:

Large posters (17"x23")—1st 1,000 or fraction.....\$10.00  
additional 1,000 or fraction.....7.50

Other publications imprinted after publication, where space permits  
1st 1,000 or fraction.....\$7.00  
additional 1,000 or fraction.....3.00

## BOOKLETS - LEAFLETS

	1 to 9	10 to 99	100 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 19,999	20,000 or more	Listed on Page 38
Accident Preventers, any selection, ea.....	\$.10	\$.05	\$.025	\$.02	\$.019	\$.018	\$.017	
Andy Larkin*, ea.....	.20	.10	.06	.05	.047	.045	.043	61
Aren't People Funny?, ea.....	.12	.07	.06	.045	.04	.035	.03	51
Be Fire Wise, ea.....	.17	.12	.08	.06	.05	.045	.04	37
Check Your Safety I.Q.*, ea.....	.06	.029	.017	.017	—	—	—	62
Close Clearance, ea.....	.20	.15	.11	.09	.085	.08	.075	66
Deadly Ideas, ea.....	.20	.10	.08	.06	.055	.05	.045	51
Defensive Driving, Truck or Bus, ea.....	.17	.10	.08	.058	.05	—	—	33
Down Time, ea.....	.12	.07	.06	.045	.04	.035	.03	56
Driver's Lucky Seven, ea.....	.10	.06	.045	.035	.03	.028	.026	61
Face the Facts*, ea.....	.06	.029	.017	.017	—	—	—	62
Fall Guy, The, ea.....	.12	.07	.06	.045	.04	.035	.03	35
First Aid Reminders, set of 8, ea.....	.33	.24	.16	.12	—	—	—	
Any selection, ea.....	.07	.05	.035	.026	—	—	—	
Follow the Leader, ea.....	.10	.06	.045	.035	.03	.028	.026	60
For Experts Only, ea.....	.23	.21	.17	.15	—	—	—	31
Have A Holiday, ea.....	.15	.05	.025	.015	.014	.013	.012	61
Heave-Ho, ea.....	.12	.07	.06	.045	.04	.035	.03	39
Highway Zoo*, ea.....	.10	.07	.05	.04	.035	.032	.03	61
Hold Everything*, ea.....	.17	.12	.08	.06	.05	.045	.04	60
How To Be A Smooth Operator, ea.....	.17	.10	.08	.058	—	—	—	33
How To Prevent Falls, ea.....	.10	.06	.045	.035	.03	.028	.026	35
I Just Gave My Seat To A Lady, ea.....	.29	.23	.21	.18	—	—	—	51
Industrial Supervisor, subscription (12 issues)	1.80	1.70	1.65	1.60	—	—	—	12
Subscription, billed monthly.....	.18	.16	.145	.135	—	—	—	
In the Clear, English, ea.....	.15	.09	.07	.05	—	—	—	63
French, ea.....	.15	.08	.06	.05	—	—	—	63
In the Pink, ea.....	.17	.09	.07	.05	.045	.04	.035	56
K.O. Dirt and Disorder, ea.....	.12	.07	.06	.045	.04	.035	.03	45
Mac Hines—Trooper*, ea.....	.20	.10	.06	.05	.047	.045	.043	61
Make Your Farm Safe*, ea.....	.06	.02	.017	.015	—	—	—	62
Man With the Badge, The, ea.....	.60	.45	.40	.35	—	—	—	10
Message to Woods Bosses, English, ea.....	.10	.09	.08	.073	—	—	—	63
French, ea.....	.15	.14	.13	.12	—	—	—	63
Origin and Progress of Farm Safety								
Education, The, ea.....	Single copy free							62
Passenger Safety, ea.....	.20	.12	.09	.065	—	—	—	33
Photocopies, any selection, ea.....	.12	.07	.06	.045	.04	.035	.03	
Plus Costs of Accidents*, ea.....	.20	.15	.08	.07	.065	—	—	4
Really Stacked, ea.....	.12	.07	.06	.045	.04	.035	.03	40
Safe at Home*, ea.....	.17	.09	.07	.05	.045	.04	.035	60
Safe Builder—same prices as Safe Railroader								28
Safe Driver—same prices as Safe Worker								31
Safe Farm Practices Leaflets*, ea.....	.06	.029	.017	.017	—	—	—	62
Safe Railroader, subscription (12 issues), ea.....	.44	.39	.29	.25	.24	.23	.22	65
Subscription, billed monthly, ea.....	.05	.039	.026	.022	.021	.02	.019	
Single issues, ea.....	.05	.039	.029	.025	.024	.023	.022	
Safe Worker, subscription (12 issues), ea.....	.70	.66	.50	.42	.40	.37	.35	50
Subscription, billed monthly, ea.....	.07	.066	.046	.036	.034	.032	.03	
Single issues, ea.....	.07	.066	.05	.042	.04	.037	.035	

	1 to 9	10 to 99	100 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 19,999	20,000 or more	Listed on Page #
Safety Color Code for Agriculture, A*, ea. ....	.06	.029	.017	.017	—	—	—	62
Safety Register, ea. ....	.15	.09	.08	.06	—	—	—	
Safety 'Round The Clock*, ea. ....	.10	.06	.045	.035	.03	.028	.026	60
Safety Zoo, ea. ....	.20	.16	.12	.09	.08	.075	.07	50
Ship Shape, ea. ....	.12	.07	.06	.045	.04	.035	.03	45
Shop Safety, ea. ....	.29	.23	.17	.16	.15	—	—	46
So Help Me!, ea. ....	.17	.09	.07	.05	.045	.04	.035	46
So You're Going On A Vacation?, ea. ....	.12	.07	.06	.045	.04	.035	.03	60
Steps to Safety, ea. ....	.12	.07	.06	.045	.04	.035	.03	46
Still Waggin', ea. ....	.12	.07	.06	.045	.04	.035	.03	56
Thanks For A Safe Year, ea. ....	.15	.05	.025	.015	.014	.013	.012	61
There'll Be A Hot Time in the Ol' Plant, ea. ....	.12	.07	.06	.045	.04	.035	.03	37
Tractor Facts*, ea. ....	.06	.029	.017	.017	—	—	—	62
Three Day Week End, A, ea. ....	.15	.05	.025	.015	.014	.013	.012	61
Vacation Daze, ea. ....	.12	.07	.06	.045	.04	.037	.035	60
Weed Out the Hazards*, ea. ....	.06	.029	.017	.017	—	—	—	62
What's In It For Me?, ea. ....	.20	.10	.08	.06	.055	.05	.045	50
Wise Bird Follows the Rules, A, ea. ....	.12	.07	.06	.045	.04	.035	.03	51
Working Together for Safety, ea. ....	.20	.15	.11	.09	.085	.08	.075	46
You Factors in Accident Causes, The, Bus or Truck, ea. ....	.17	.10	.08	.058	.05	—	—	33
Your 10,000 Mile Living Room*, ea. ....	.10	.04	.03	.025	.022	.021	.02	61

## POSTERS - BANNERS - FLAGS

"A" size, any selection, ea. ....	.12	.08	.055	.045	.04	.035	.032	47
"A" size, all one poster, ea. ....	.12	.07	.05	.04	.035	.032	.029	47
"B" size, any selection, ea. ....	.20	.19	.16	.13	.10	.085	.075	47
"B" size, all one poster, ea. ....	.20	.17	.15	.12	.095	.08	.07	47
"C" size, ea. ....	.50	.40	.35	.30	—	—	—	51
"C" size, subscription (12 posters), ea. ....	4.00	3.50	3.00	2.50	—	—	—	51
Jumbo Posters, subscription (12 posters), ea. ....	54.00	51.00	48.50	—	—	—	—	49
Jumbo Posters, subscription, billed monthly, ea. ....	5.40	4.40	4.10	—	—	—	—	49

	1 to 9	10 to 49	50 to 99	100 to 499	500 or more	
POSTER SETS						
Construction Posters (set of 12, 2-color), ea. ....	2.50	2.25	2.10	1.95	1.80	
Logging Posters (set of 12, 2-color), ea. ....	2.50	2.25	2.10	1.95	1.80	
Marine Posters (set of 12, 4-color), ea. ....	2.50	2.25	2.10	1.95	1.80	
Office Posters (set of 12, 4-color), ea. ....	2.50	2.25	2.10	1.95	1.80	
Petroleum Posters (set of 12, 4-color) ea. ....	2.50	2.25	2.10	1.95	1.80	
Fertilizer Posters (set of 12, 2-color), ea. ....	2.00	1.85	1.85	1.75		
Mining Posters* (set of 12, 2-color), ea. ....	2.00	1.85	1.85	1.75		
Printing and Publishing* (set of 12, 2-color), ea. ....	2.00	1.85	1.85	1.75		

	1 to 4	5 to 49	50 to 999		
Motor Transportation Posters (set of 48), ea. ....	7.68	6.48	5.16		30

	1 to 9	10 to 99	100 to 999	1,000 to 4,999	Listed on Page #
Payroll Enclosures, 1st 100 sheets ....	11.50	—	—	—	51
Additional 100 sheets, ea. ....	1.95	—	—	—	
Poster Directory*, ea. ....	.50	.40	.35	.35	47
Poster Electros, ea. ....	3.45	3.45	3.15	3.15	51
Poster Frames, "A" size, ea. ....	1.15	1.00	.90	.90	51
"B" size, ea. ....	1.70	1.40	1.15	1.15	51

BANNERS - FLAGS					
Award Desk Pennant, Honor or Merit, ea. ....	1.00	.70	.60	—	53
Award Pennant, Honor or Merit, ea. ....	18.50	16.00	16.00	—	53
Additional Stars, ea. ....	.50	.50	.50	—	
Green Cross Flag*, ea. ....	9.75	9.25	8.75	8.75	53
Safe Driver Award Banner, ea. ....	17.50	16.00	16.00	—	32
Safety Desk Flag*, ea. ....	1.00	.70	.60	—	53

	single banner	2 to 9	10 to 49	50 or more	
Safety Banners					
Subscriptions (12 banners), ea. ....					49
INDOOR, each ....	74.00	69.00	66.00	63.00	
OUTDOOR, each ....	84.00	79.00	76.00	73.00	
Subscriptions (12 banners), billed monthly, ea. ....					
INDOOR, each ....	7.40	6.15	5.50	5.30	
OUTDOOR, each ....	8.40	7.00	6.45	6.15	

## BADGES, BUTTONS & AWARDS

	1 to 9	10 to 99	100 to 999	1,000 to 4,999	Listed on Page #
Committee Badge, ea.	.75	.60	.55	.53	10
Personalized, ea. (plus die charges), ea.	—	.65	.60	.55	10
Expert Driver Award Certificates, ea.	1.25	1.00	.75	.75	34
Meritorious Service Award Pins, ea.	.70	.58	.55	.54	10
No-Accident Award Pins, Enamel, ea.	.65	.53	.50	.49	52
No-Accident Award Buttons, Metal					
Bronze (1 to 4 years), ea.	.45	.31	.28	.27	52
Silver Plated (5 to 9 years), ea.	.46	.32	.29	.28	52
Gold Plated (10 to 40 years), ea.	.47	.33	.30	.29	52
(Add 10% Federal Excise Tax on Silver and Gold)					
Personalized Committee Badge (plus die charges), ea.	—	.65	.60	.55	10
Safe Driver Award					30
Safe Driver Award Shoulder Patch, ea.	.50	.40	.35	.30	34
Safety Contest Trophy, ea.	25.00	23.00	22.00	22.00	52
Safety Lapel Pins*, ea.	.47	.35	.32	.31	52
Safety Patch*, ea.	.50	.35	.25	.20	52

## OTHER PUBLICATIONS & SERVICES

Accident Analysis Chart, pads of 50, ea.	\$1.05	\$1.00	\$0.90	\$0.85	11
Accident Facts*, ea.	.75	.65	.55	.50	11
Accident Prevention Manual, ea.	9.00	8.50	8.00	8.00	7
Section Reprints, ea.	.75	.60	.50	.45	7
Accident Rates Pamphlets, ea.	.35	.35	.29	.29	11
Accident Record Forms, Industrial					
IS-1A, IS-3, IS-5A, IS-7, IS-8, ea.	.06	.023	.017	.015	11
IS-6 (pads of 100), ea.	.35	.35	.35	.35	11
Accident Record Forms, Motor Transportation					
Veh-1, Veh-4, Veh-6, Veh-12, each	.08	.023	.017	.015	34
Veh-3, each	.08	.035	.029	.023	34
Veh-2, Veh-5, each	.12	.08	.044	.044	34
Veh-10, each	.23	.17	.138	.12	34
Administrative Units—AA-1	23.00				3
A-1	17.50				
B-1	14.00				
C-1	8.50				
A-2	18.00				
B-2	11.00				
C-2	7.00				
B-11					
Are You Inviting Corn Picking Accidents?*, ea.	1 copy, 1.25; 2 to 9, .90; 10 to 99, .80; 100 or more, .75				62
Dash Cards, sets, ea.	.69	.58	.44	.40	33
Dash Stickers, set of 12, ea.	.75	.60	.50	.47	33
Date Sheets, any selection, ea.	.17	.13	.08	.07	7
Current Set, including binders, ea.	19.50	18.00	17.50	17.50	7
Binders, 1 1/2", ea.	3.00	3.00	3.00	3.00	7
Decalcomanias, any selection, ea.	.12	.07	.058	.046	20
Detail Sheets, any selection, ea.	.12	.09	.08	.07	7
Current set, including binder, ea.	10.20	9.50	9.00	9.00	
Disaster Control, ea.					
Single copy, Free; 2-49, .50; 50-99, .40; 100 or more, .35					37
Do You Know?, ea.	1.00	1.00	1.00	1.00	62
Driver Letter, subscription, ea.	.52	.40	.29	.26	31
Driver Memo Pads, set of 48 pads, ea.	7.50	7.25	7.00	—	34
Farm Safety Demonstrations*, ea.	.23	.18	.17	.16	62
Farm Safety Discussions*, ea.	.23	.18	.17	.16	62
Farm Safety Exhibits*, ea.	.06	.029	.017	.017	62
Farm Safety Review — A national farm safety magazine especially for agricultural leaders. Contains new ideas, materials and program helps. Published bi-monthly. One-year subscription, \$1.00; quantity rates on request.					62
Fleet Safety Manual, ea.	8.50	8.00	8.00	8.00	30
Individual Parts, ea.	.85	.75	.70	.63	30
Fleet Safety Memos*, ea.	.17	(Write for prices on larger quantities)			
Foremen's 5 Minute Talks, Book I, II, III, IV, and V, any selection, ea.	1.70	1.40	1.10	1.00	18
Green Cross Electros*, 1/2", 3/4", ea.	.75	.69	.69	.69	52
3/4", 1", ea.	1.38	1.20	1.20	1.20	52
1 1/2", ea.	2.00	1.90	1.90	1.90	52
Handbook of Accident Prevention, ea.	1.50	1.25	1.00	.90	13
Hospital Safety Manual, ea.	1 to 10, 2.00; 11-50, 1.70; 51-100, 1.60; 101 or more, 1.50.				63
Hospital Safety Service*, ea.	10.00	—	—	—	63
How to Make the Safety Speech*, ea.	.69	.63	.58	.58	16
How To Start a Safety Program*, ea.	.75	.60	.50	.40	4
Illustrated Safety Talks, ea.	5.00	4.70	4.50	—	
Jig and Fixture Design for Woodworking Safety*, ea.	1.75	1.50	1.20	1.10	23



	1 to 9	10 to 99	100 to 999	1,000 to 4,999	Listed on Page 28
Manual of Accident Prevention in Construc- tion,* ea.	3.00	—	—	—	28
National Directory of Safety Films*, ea.	.75	.65	.55	.50	8
National Safety News, subscription, ea.	5.50	5.00	4.60	4.40	2
Non-member prices, ea.	7.50	6.90	6.30	6.00	
(add \$1.00 for foreign, except Canada & Pan American Union)					
News Letters, subscription, ea.	1.15	1.00	.85	.85	4
Off-The-Job Safety Kit*, ea.	1.00	—	—	—	59
1,000 Safety Bell Ringers*, ea.	.35	.29	.23	.23	16
Psychology and The Supervisor, ea.	.60	.40	.35	.30	13
Psychology of Safety in Supervision, set, ea.	1.05	1.00	.90	.85	13
Public Safety*, subscription, ea.	4.00	3.80	3.45	3.45	30
(add \$.50 for foreign, except Canada and Pan American Union)					
Reaction Timer, ea.	.20	.07	.035	.025	34
5,000 to 9,999, .022; 10,000 to 19,999, .02; 20,000 or more, .018					
Safe Practices Pamphlets, any selection, ea.	.45	.40	.35	.33	7
Set, in binder, ea.	19.50	18.00	17.50	17.50	7
Binder only, ea.	2.50	—	—	—	7
Safety Devices and Ideas, ea.	1.25	1.00	.90	.85	23
Safetygraphs, complete, ea.	11.55	10.90	10.55	10.30	20
Safetygraph only, any selection, ea.	8.00	7.60	7.25	7.00	20
Safetygraph Easels, only, ea.	3.55	3.30	3.30	3.30	20
Safety in Foremanship, sets, ea.	1.95	1.70	1.50	1.45	13
Safety in Quarry Operations, ea.	1.25	1.00	.90	.80	62
Safety Inspection Checklist, pads of 50, ea.	1.05	1.00	.90	.85	11
Safety Instruction Cards, any selection, ea.	.05	.025	.019	.017	7
Complete set with file case & guides, ea.	12.65	12.10	11.55	11.00	7
Industrial Set incl. file case and guides, ea.	8.25	7.70	7.15	6.60	7
File case and guides only, ea.	2.20	2.10	2.00	2.00	7
Safetyman's Library, ea.	65.00	—	—	—	6
Safety Manual for Graphic Arts Industry*, ea.	2.50	—	—	—	64
Safety Manual for Marine Oil-Fired Watertube Boilers, ea.	1.50	1.25	1.15	1.10	63
Safety Manual Reprints, ea.	.75	.60	.50	.45	7
Safety Reprints—see Special Releases					
Safety Talks for Construction and Maintenance Foremen, ea.	1.70	1.40	1.10	1.00	18
Safety Training Institute					
Fundamentals of Industrial Safety	75.00	—	—	—	9
Safety Management Techniques	90.00	—	—	—	9
Sammy Safety					54
Showmanship in Safety, ea.	1.25	1.00	.90	.85	8
Speaking Straight—Thinking Straight*, ea.	.29	.23	.23	.23	16
Special Releases—1 or 2 pages, each	.10	.04	.03	.03	
4 pages, ea.	.10	.07	.06	.05	
6 pages, ea.	.15	.09	.08	.07	
8 pages, ea.	.15	.11	.09	.08	
10 pages, ea.	.20	.13	.11	.09	
12 pages, ea.	.20	.15	.13	.11	
16 pages, ea.	.20	.17	.14	.12	
18 pages, ea.	.25	.19	.15	.13	
Ten Commandments in Machine Operation, 4" x 7", ea.	.10	.05	.03	.02	23
9 1/4" x 10 3/4", ea.	.30	.25	.20	.18	23
30 Tailboard Talks, ea.	1.70	1.40	1.10	1.00	18
Transactions, sets, ea.	6.90	6.30	5.70	5.70	4
Woman on the Job, The, ea.	2.50	2.00	1.90	1.80	8

## FILMS

	Single copy	2 to 9 copies	10 or more copies	Rental or Preview	
Class I Films, ea.	\$ 20.50	\$ 19.50	\$ 18.40	\$ 5.00	
Class II Films, ea.	14.50	13.70	12.90	5.00	
Class III Films, ea.	32.50	31.00	30.00	5.00	
Class IV Films, ea.	40.00	38.00	37.00	5.00	
Class V Films, ea.	53.00	50.00	47.00	5.00	
Class VI Films, ea.	95.00	91.00	87.00	10.00	
Class VIII Films, ea.	9.00	8.50	8.00	5.00	
Human Factors in Safety, 35mm set (6 films), ea.	115.00	109.00	103.00	7.50†	15
Personal Side of Safety, 35mm set (5 films)* ea.	70.00	65.00	63.00	7.50†	48
16mm set (5 films)* ea.	190.00	180.00	175.00	10.00†	48
Professional Driving Series,					
16mm Black & White set (5 films), ea.	245.00	235.00	230.00	10.00†	32
16mm Color set (5 films), ea.	425.00	410.00	400.00	20.00†	32
Safety Management for Foremen, 35mm set (10 films), ea.	115.00	109.00	103.00	10.00†	17
Speaking of Safety, 35mm set (6 films), ea.	115.00	109.00	103.00	7.50†	16
Supervising for Safety, 35mm set (3 films), ea.	58.00	55.00	52.00	7.50†	14
16mm set (3 films), ea.	145.00	138.00	133.00	10.00†	14

† Preview service charge for sets only. Individual films from sets may be previewed or rented for the service charge specified for the film Class (See Classes I to VIII, above). Preview and rental rates are per week or fraction thereof. User pays return shipping charges.



**NATIONAL SAFETY COUNCIL**

**CHICAGO 11, ILLINOIS**